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SPECIAL LECTURE.

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LIEUT.-GENERAL R. WARDLAW, C.B., Inspector-General of Cavalry,  
in the Chair.

ON THE RUSSIAN MILITARY OPERATIONS IN BULGARIA.

By ARCHIBALD FORBES, Esq.

ONE word in preface. I propose to confine myself exclusively to matters military. Political considerations or complications can have no direct bearing on the treatment of subjects purely military. It has always seemed to me that the only politics a soldier, as a soldier, need know, are devotion to his Sovereign and duty to his country. As a war correspondent, I have always tried to confine myself to the treatment of military topics, and to the description of what bears upon them directly; nor do political questions come within the range of the subject which the title I have chosen for this paper definitely prescribes.

All Europe knew that during the autumn and winter of 1876, a great Russian army was being mobilised in Bessarabia and the districts of the south of Russia adjacent thereto, in anticipation of the contingency of war with Turkey. That mobilisation was indeed nominally complete some time before the declaration of war. Great preparations had unquestionless been made. Russia had put forth her yet unstrained strength in the equipment of the appliances of an army of invasion. There was no shortcoming in the quota of field batteries; there were siege cannon enough and to spare; the outfit of ambulance trains and their belongings seemed actually superfluous in the wealth of their completeness. But all these things do not achieve the efficiency of an army. What avail cannon, transport, and hospitals, if the number of actual fighting men be insufficient? On paper, in this respect, there existed indeed no insufficiency. It was said that the Grand Duke Nicholas, the Commander-in-Chief, had demanded of the War Minister an army of 500,000 men, if the prompt success of the enterprise were

to be achieved; and that Milutine, telling him this was impossible, had pledged himself to put at the disposal of his Highness a thoroughly equipped and serviceable force of actually, not nominally, 250,000 men. Fadieff reckons, in his "Opinions on the Eastern Question," that if 150,000 Russians are to make their way into Constantinople, 250,000 must cross the Danube; and these data may have been the basis of the Russian War Minister's calculation. On paper, when war was declared, it seemed clear that the War Minister had even more than fulfilled his engagement, if he made it in the terms I have referred to. The force known as the "Army of Operation" consisted of seven army corps, the 4th, 8th, 9th, 11th, 12th, 13th, and 14th. The "Army of Odessa" was made up of the 7th and 10th corps, the earliest mobilised of all; and this force, although called upon for the time to stand fast in position to guard against the contingency of a Turkish descent on the region it guarded, would be available for invasion purposes, as soon as the further levies which were being mobilised were available for service, or as soon as circumstances should have discounted the danger its presence in position guarded against. The nominal strength of the infantry of a Russian army corps is 32,000 men: the artillery and the cavalry division bring its nominal strength up to 36,000 men of all arms. The nominal strength, then, of the "Army of Operation,"

with its seven army corps, was .....	252,000
Adding ten regiments of Cossacks.....	4,000
And a rifle brigade .....	3,000
Sappers, pontooniers, marines, mountain batteries, &c. . .	6,000
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Its total nominal strength would reach .....	265,000
The "Army of Odessa," with its two corps, numbered	
on paper.....	72,000
And its extras, say .....	3,000
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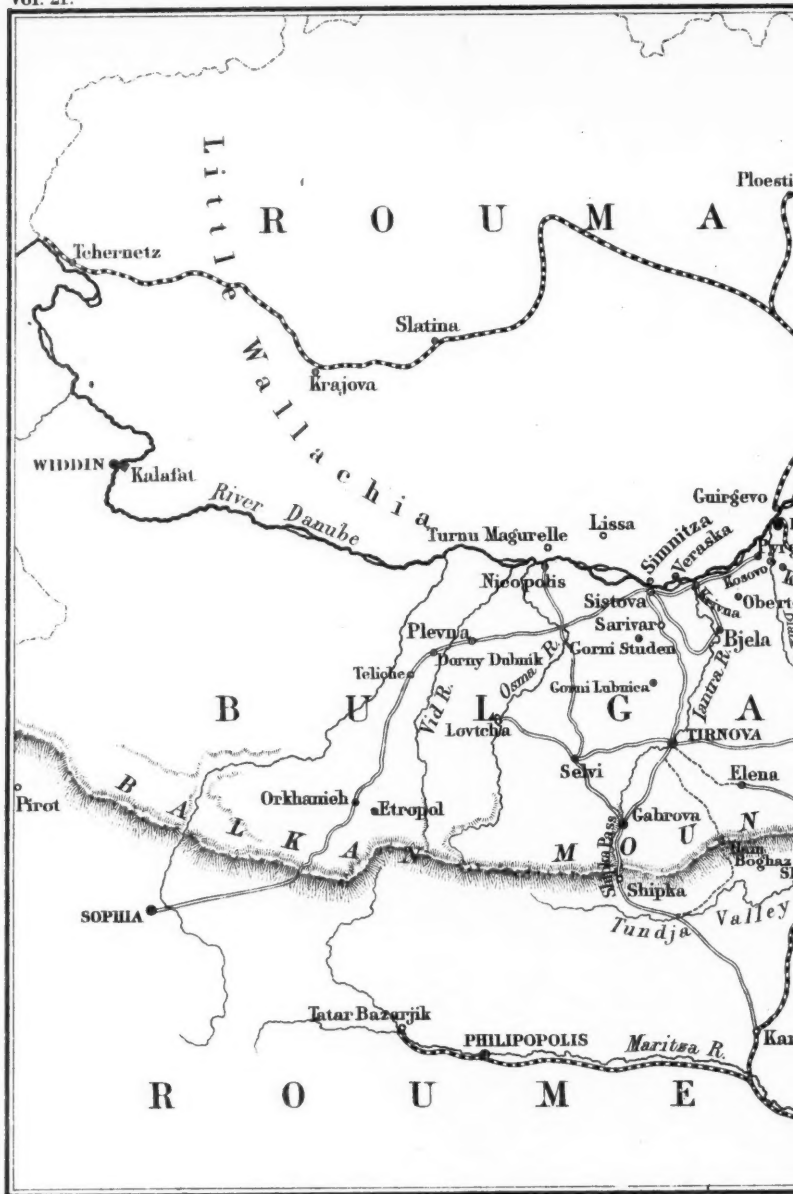
340,000

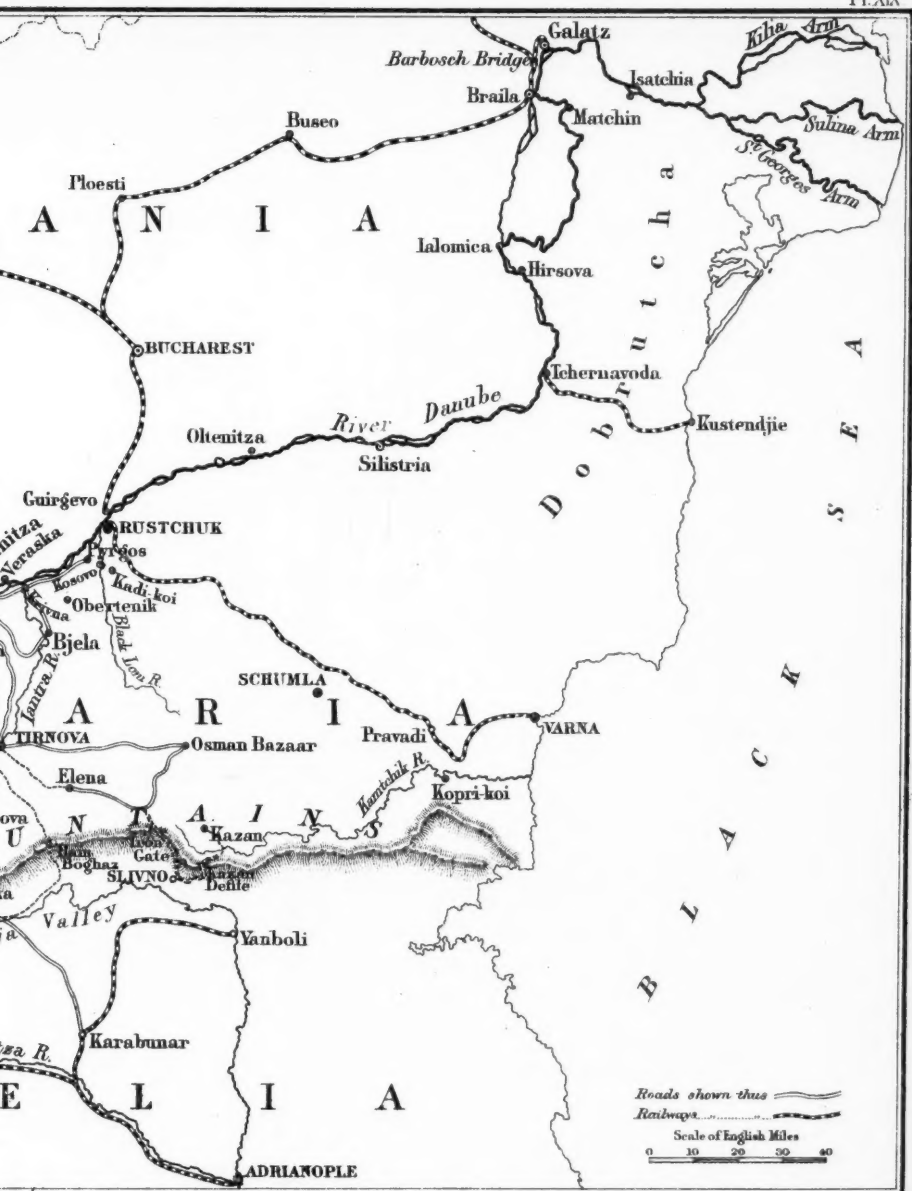
The grand nominal total, therefore, at the disposal of the Grand Duke Nicholas, when war was declared, was 340,000; or, deducting one corps as being immovable in the Odessa-Crimea district, there remained an available total of nominal strength of, say 300,000 men. Supposing that strength to have actually existed in sabres and bayonets, and not on paper alone, Fadieff's reckoning of the number requisite for the crossing of the Danube would have been approximated. The surplus of 50,000 might not be too great to reckon as absorbed in weeding out feeble men, in the march from cantonments to the Danube, and in the operation of crossing the great river.

But it never was maintained that the corps were quite up to their nominal strength. Russian military testimony set down the marching-out infantry strength of each corps at about 28,000 men. My own deliberate conviction is that he who believes that 170,000 Russian soldiers crossed the Pruth in April, May, and June of last year, is above the mark. Yet, further, I do not believe that until the arrival of the reinforcements of which the current began to set in about the third week in August, there were ever 145,000 Russian soldiers under arms



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in Bulgaria at one time, even including Zimmermann's force in the Dobrutcha. It must be said, however, that the Russian corps had their full quotas of artillery. With the batteries of its cavalry division the artillery complement of an army corps is 108 guns: this would give to the seven corps of the "Army of Operation" a grand artillery total of 626 guns, and I believe that close on 600 actually crossed the Danube. Assume that 150,000 soldiers crossed, and you have the proportion of four guns to every 1,000 men. This is one more gun per 1,000 men than, as I understand, obtains in our own, the German, and the French armies.

It may be asked what is the reason, or what are the reasons, that the Russian corps took the field thus greatly, as I believe them to have been, below their nominal strength? The true answer, as I take it, rather trenches on the field of politics. I have the firmest conviction that not until the eleventh hour did Russia regard it as at all inevitable that she should engage in war; when she suddenly found herself face to face with that stern necessity, I believe that she was in a measure taken by surprise. This I hold to have been the main reason of the great deficiency; but, in truth, I question if a Russian force was ever in reality up to its paper strength.

We are bound to assume that there was a plan of campaign. Indeed, I have reason to believe that what we call the "general idea" was prepared in St. Petersburg before the Grand Duke Nicholas came down to army head-quarters, and that the chief responsibility rests with Count Heidaü, the head of the Great General Staff of Russia. I think most reflecting soldiers will admit that the governing idea of the scheme was, in itself, correct strategy. A force marching from the Galatz-Braila base—a railway base, and therefore more eligible than Hirsova, was to march through the Dobrutcha with a multi-fold mission. By occupying Kustendjie it was to prevent the landing of troops at that port, which, crossing the Isthmus to Tchernavoda, might be within distance to imperil the line of Russian communications between Braila and Buseo. Penetrating further to the south, it was to threaten—and indeed, assuming enterprise in its leader—assail the great, indeed the only line of Turkish communications and supplies; that leading from the sea at Varna over Pravadi into the heart of the Quadrilateral. In no unlikely contingency it might mask Schumla, or besiege Varna, or do both. He would have been sanguine who should have hoped for the possibility that it might carve out a way for itself through the Pravadi Pass down into the territory south of the Balkans, and give the hand to the main Russian column in the great Roumelian valley. True, Diebitch's march to the gates of Adrianople lay through the Pravadi, before from Koprikoi he turned seaward along the valley of the Kamtchik. But then Diebitch marched after a crushing victory; Varna was in his hands; the double-headed eagle, not as now the crescent, waved dominant over the waters of the Black Sea. Still the rôle of a left advance of adequate strength and skilfully ordered, should have been hardly less important in 1877 than in 1828. In addition to the services I have described, or perhaps more correctly alternately with them, it seemed feasible to hold that it lay within its

scope to besiege Silistria, and by threatening its flank and rear, to distract the attention of a Turkish Field Army operating from the Quadrilateral against the line of advance of the Russian main column. So much for the idea actuating the detailing of a left-column of attack.

As for the main invading force, the military genius of a Napoleon, a Wellington, or a Moltke, was hardly needed to strike out for it the obvious course of operations. A little close reasoning only, was needed to outline them in advance. The conditions were eminently simple. The Danube had to be crossed. The Balkans had to be passed. The straightest route to Constantinople, that by the coast, the dominance of the Turkish Fleet in the Black Sea rendered impossible. Schumla and Varna were the stern portals of the Pravadi Pass. The railway in 1877 furnished an intermediate base in Little Wallachia, little more distant in effect from the ulterior base in Russia, than had been Braila and Hirsova in 1828. The Shipka Pass affords incomparably the easiest crossing of the Balkans of any between the sea and Orchanie. From the Wallachian base over the Shipka the road to Adrianople is shorter and better than from the Dobrutcha to the beautiful city laved by the waters of the Maritza. Bulgaria was fertile and friendly; the Dobrutcha, barren, unhealthy, and hostile. Once across the Balkans into the Tundja Valley, neither passes nor fortresses, but a land flowing with milk and honey, a land too mainly peopled by enthusiastic friends, lay between the invaders and Adrianople. Rustchuk might be masked. Nicopoli with its crumbling old-world ramparts could hardly resist a *coup de main*. A force might be detailed to cope with the Turkish Field Army of the Quadrilateral, if haply there should be one. With the co-operation of the left advance, there could be no difficult task in driving it into Schumla and watching it there. The force detailed to reduce Nicopoli ought to suffice after the accomplishment of this operation for guarding the right flank of the line of advance, and neutralising the risk of danger from Osman Pasha's force occupying Widdin. Reasoning out the problem on these lines, the obvious task of the Russian strategists was to select that point for the crossing of the Danube which should at once give the minimum of risk to a line of communications from the Danube to the Balkans, and afford the nearest, best, and most numerous roads between the river and the Shipka Pass. That point, as reference to any good map will show, must lie between the mouth of the Jantra and the mouth of the Vid. This probably was a narrow enough definition for the St. Petersburg council of war.

It would remain to fix and allot the forces for the respective objects. We have seen that the "Army of Operation" consisted of seven corps, and that one of the corps of the Odessa Army, or at least the greater part, was also available. Two corps then, or say 70,000 men to constitute the left column marching through the Dobrutcha. Two corps more—70,000 men to mask Rustchuk, and ward off the Turkish Field Army of the Quadrilateral from interfering from the left, with the line of communications of the main Russian advance. Yet another corps, 35,000 men, to reduce Nicopoli, and to further protect the right flank of the main advance. It cannot be urged that these

strengths, had they existed, were inadequate for their respective purposes, especially taking into consideration the Russian superiority in cavalry. There remained then, available for the main advance three corps, say 100,000 men, exclusive of the extras, the Cossack division, the Tirailleur brigade, and the Bulgarian legion. Diebitch had marched from before Schumla with but 20,000 men, yet he had not only quartered himself in the Konak of Adrianople, but had daringly shown a front half way between that city and Constantinople itself. Times had changed indeed since 1828, but surely 100,000 men was a sufficient force wherewith to force the Balkans, and that enterprise accomplished, march on Adrianople through a friendly territory whose roads are good and unimpeded by the cannon of a single fort!

Unfortunately for the Russian arms, the scheme of campaign I have outlined had for its fundamental basis the assumption that the army corps at least should approximate their full strength. Ingenious and well devised on this hypothesis, it stood vitiated and wrecked in virtue of the huge numerical default. A Napoleon, a Wellington, or a Moltke, under the altered conditions would have cast it aside, and carved out another even at the eleventh hour. The Russian leaders lacked freedom of initiative, and as well perhaps fertility of resource; and they held to the scheme though the shortcoming of men had abolished its *raison d'être*; had in fact, to use a rough phrase, knocked the bottom out of it. How adversely this persistence affected the Russian fortunes, will presently be made apparent. I question whether the general staff had accurate returns, and so knew the grim total of the numerical defalcation; I believe that in common with a great many people who were not Russians, they underrated the strength of the resistance the Turks have proved themselves capable of offering.

Taken by surprise, or not, the Russians were certainly prompt enough in taking their first step when war was declared. That this promptitude alone saved the Barbosch bridge, and thus preserved for them the continuity of their railway communications, was sufficiently obvious at the time. Respecting their occupation of the Principalities, there is little to be said. Their marching, camping, and provisioning dispositions were efficient enough. They feinted with sufficient ingenuity at Jalomica, opposite Hirsova, at Oltenitza, about Giurgevo, and at Nicopoli. They assiduously kept away from showing themselves at the point at which, at the final council of war at Ploesti, it was decided to essay the crossing. They lent the Roumanians siege guns wherewith to keep Osman Pasha in play behind his Widdin ramparts. But time was all important to them; and yet they seemed to waste time strangely. Wittgenstein in 1828 had crossed the Danube at Isatchia below Galatz, on the 9th of June; in 1854 Paskiewitz crossed the great river in the early days of May, and appeared before Silistria on the 19th of that month. It is true that in the spring of 1877 the Danube ran exceptionally full, and that its turbid waters remained high for many days after the normal period of subsidence. Yet it is impossible to maintain that the Danube could not have been crossed weeks before it actually was passed. When I



visited Oltenitza a month before the invasion of Bulgaria, the river there had no greater breadth than 800 yards. The crossing, so far as the state of the river bore on the question, was certainly practicable at Simnitza, a fortnight before Dragomiroff's pontoons were launched.

Wherefore, then, the delay? Promptitude was of even more than its common value, great as the value of promptitude ever is in warfare. Every day, every hour, of delay played into the hands of the Turks, diminishing the backwardness of their preparation; diminishing, too, the space of time available for satisfactory campaigning. The roads it is true, bad by reason of the lateness of the spring and the wetness of the early summer, had indeed made difficult the marching of troops and the conveyance of supplies, but the railway more than compensated for this disadvantage. There were two causes, to my thinking, which contributed to the delay in the Russian crossing of the river. The four corps composing what was called the first line of the "Army of Operation" had been so far advanced in organization at the time of the declaration of war that they had been able to march, although far below their full strength, close on the last notes of the trumpet-blast announcing the declaration of war; but it had been otherwise with the three corps—the 4th, 13th, and 14th constituting the so-called "second line." They required much subsequent making up, in almost every respect, and the first advance had to lie long in their cantonments and camps a few marches retired from the Danube, for the equipment and arrival of their supports. This was one reason. The other was really and truly the size of the river, hindering the passage of it at a particular point to which much and obviously undue importance was attached. It was thought essential that the left column of attack should be the earliest to commence operations. Marching through the Dobrutcha it was hoped and expected that Zimmermann would hinder the Quadrilateral Field Army from concentrating its attention on the main Russian advance; and that indeed Zimmermann might paralyse altogether the Turkish defence and offence alike north of the Balkans, the fortresses of course excepted, by a blow at what is virtually the only line of communication and supply for the Turkish forces north of the Balkans—the road and the railway from the sea at Varna. Now the crossing place for this left column was the Braila-Galatz stretch of river. The river itself presented no serious obstacle to bridging; but the stretch of swamp, lagoons and backwaters lying between the stream and the high ground about Matchin was a terrible difficulty; finally overcome only by the laboured construction of a roadway on piles and trestles. Zimmermann could not make good his crossing and take Matchin before the 23rd June; the crossing of the main column of invasion was retarded, purposely I believe, till he had fairly entered on his tramp up the Dobrutcha.

I may at this point follow out the short, dreary, story of Zimmermann's fortunes, and have done with him. Had he been two corps strong, he had, as has been indicated, mighty potentialities. The scheme of his mission was sound, even vigorous, and the results might have been brilliant, for Zimmermann is a capable man. But

he never has had 40,000 men at his disposal; he never has had reasonable discretionary powers; his supply service has always been subsidiary. He has been shunted as it were into a siding and left there, to eat his heart out and watch the decimation of his troops by malaria. I think many students of strategy will be inclined to agree with me that after the Plevna collapse on the last day of July, it would have been wiser to have reinforced Zimmermann so strongly as to have enabled him to strike at the line of the Turkish communications, and to distract the attention of Mehemet Ali from the army of the Cesarewitch, than to direct every man on the bridge at Simnitsa. In default of reinforcements and in virtue of injunctions to inaction Zimmermann has lain supine all the summer. He and his 35,000 men might as well never have crossed the Pruth; for he has not been so much as a fly on the wheel of the Turkish resistance. And now that late in the autumn he has been reinforced and is bestirring himself, I venture to express the opinion that the direction of his groping movement towards Silistria is singularly unwise. He is creeping along, with one flank to an impassable river, the other shown open and exposed to the new and eminently strategic front of Suleiman Pasha.

I shall not again advert to Zimmermann, except to say that his being once well on his march over the knolls of the Dobrutcha, was the immediate signal for the crossing of the head of the main column of invasion. The finessing movements which preceded Dragomiroff's successful attempt below Sistova had been previously commenced. These I make bold to aver were well conceived and skilfully carried out. I am well aware that in making this averment I express an opinion contrary to that made public by a military writer whose judgment is entitled to the highest respect. He has stated, that "although there was a deliberate intention of keeping the movements secret, yet they were to be read as plainly as possible by all the world;" and he adds, "Thus, as is sure to happen in such cases, the Russian Officers were in darkness, while everybody else who wished to know, including the enemy, might easily penetrate the grand secret." Now, nothing is more certain than that every Russian Officer whose acquaintance with the tactics was requisite for the due performance of his duties, so far from "being in darkness," had at least such information as brought him to his allotted place at the appointed time. I venture to hold that the Russian Officers were not so much in darkness as that having been pledged to secrecy, they declined to throw light on the subject for the benefit of inquiring correspondents; and that the current phrase, "I hav'n't the faintest idea!" was an euphemism for "I'm d——d if I tell you." In all kindness I would observe that it is easy to be "wise after the event;" but it is the way of the world to judge by the results. The critic who subsequently wrote that every one who wished to know, including the enemy, might easily penetrate the grand secret, certainly did not personally illustrate at the time, this alleged facility of prognosis. While the first Russian boat-load was on the Sistova side of the Danube by three in the morning, he did not reach Simnitsa till near

noon. It seems clear enough that for once a pretty strong red herring had been dragged across his acknowledged keen military scent. Speaking of myself, I reached the scene of action in time, by the merest accidental good fortune. I was at Lissa, fifteen miles away from Simnitzer, when at ten o'clock the night previous to the morning of the crossing, Prince Mirski, who with all his staff had known the arrangements for days, was kind enough to give me the hint.

That the Russians did well in selecting Simnitzer as their crossing place, seems to me apparent enough. On the reasoning I have previously sketched they were limited to the section of the Danube between the mouth of the Jantra and the mouth of the Vid. In this section there are but three available points: from Veraska to Krivna at the mouth of the Jantra; from Simnitzer to Sistova; and from Turna Magurelle to Nicopoli at the mouth of the Vid. Now, from Krivna there are good roads to Bjela, and thence a beautiful *chaussée* to Tirnova; but the crossing-place is swampy, and there was a Turkish Army at Bjela within sound of a cannon shot fired on the Danube at Krivna; added to which, the line of communication over this route would have been inconveniently near to Rustchuk. From the port of Turna Magurelle the bridging of the Danube to Nicopoli would, indeed, physically have been no difficult task, and the road from Nicopoli over Selvi to the Shipka is no longer than that from Sistova by Tirnova. But the batteries of a fortress, such as it was, frowned over the water here, and the crossing would have had to have been essayed under their fire. Added to which, Turna is further from its railway base at Slatina than is Simnitzer from its railway base at Giurgevo; and Slatina is further from Bucharest than is Giurgevo. Sistova was an open town; it was known that the Turks were not in force there; a bridge head at Sistova was capable of being made easily defensible in case of reverse; from Sistova to Tirnova ran not one but several good and easy thoroughfares. It is true that if the Nicopoli-Selvi line had been successfully achieved, Osman Pasha would not to-day have been in Plevna, but then, as it was, he should not be there. On the whole, the Simnitzer-Sistova point, as being easiest, safest, most central, and best of access, was well chosen.

There is little to remark on the actual operation of crossing. It was successful, and that, after all, is the main thing. It was carried out by the 8th corps, commanded by General Radetsky: Dragomiroff's—the 14th Division—had the post of honour; the 9th Division, under Prince Mirski, was in support. The dispositions were rough and inartistic; substantially, a whole army corps was exposed for hours on the flats below Simnitzer to Turkish cannon fire, if there had been any worth speaking of; and up to the time of the occupation of the ridge, this was possible at any minute. All the boats focussed on one point; there was no diversion by alternative attempts to right and to left. The Turks were in feeble force—a brigade of infantry and a couple of batteries. But the Russian butcher's bill—nearly a thousand killed and wounded—showed that Dragomiroff had inartistically exposed his soldiers, and that the Turks, scanty as they were in numbers, had made a sturdy fight of it. I may remark, *en passant*, that I fear the

Russian generals have not educated themselves out of that relic of barbaric warfare—the pride of being able to show, in return for a success gained, a heavy butcher's bill, in evidence that the work could have been no child's play. This is a curious weakness of human nature, but it is neither confined to Russians nor to soldiers. The successful passage of the Balkans by Gourkho and Mirski was an event in European history of an actual, and still more of a contingent, importance scarcely second to any occurrence of the century. I need not here dilate on its significance. Yet because it cost but a few hundred men, I am to believe, if I am to judge from the newspapers of the time, that it caused less talk in England—less of what we know under the ugly, vulgar term of "sensation," than did one day's fighting at Shipka, where indeed blood flowed in torrents; but the interest of which was caused by its horrors, not by its consequences.

The crossing achieved, there remained to utilise the success. In three days as many divisions of Russian infantry stood on the Turkish bank. Two all-important matters demanded the immediate attention of the Russian commander-in-chief and his staff. First, the technically tactical results of the easy crossing had to be grasped; secondly, the strategical scheme of the campaign demanded searching examination and consideration.

First, as to what I may call the preliminary tactics. Assuming on the part of the head-quarter staff the discretion and the enterprise to depart on cause shown, from an already devised line of procedure, the information that would have influenced their reconstruction of the plan of campaign could have been furnished only by the reports brought back by cavalry exploring expeditions promptly initiated, judiciously led, dashing pushed home. Certain facts had to be discovered—where and in what force were Turkish armies? how wide a free margin was there on either flank of the line of advance to the Balkans? what were the prospects of interruption, or the contrary, to that advance? what were the likely dangers to its communications when it had been made? It behoved the Russians the very moment they had made good their footing on the Turkish bank to hurry cavalry across by every exertion, and to spread the horsemen fan-like over the face of Bulgaria. Bjela is five hours' ride from Sistova, Tirnova is twelve, Plevna is ten. In three days, at the outside, after the crossing day, the cavalry of a North German army would have patrolled every village in the half-oval on whose margin stand these three towns, have felt what enemy might be standing on that margin, and have sent back to a general at Sistova or Simnitza, such intelligence as would have sufficed him for the devising or the modification of a scheme of action. But the Russians essayed no such enterprise. Several days passed before their bridge was practicable, and even then more time elapsed before cavalry in any numbers began to cross. When cavalry did go out into the interior it was not to scout, to explore, to feel, to report. They went as the heads of columns marching for a given object on a predetermined scheme of action. In truth, they set about building a house without having laid any foundations.

Secondly, as to strategy. It must be taken for granted that by

this time the Grand Duke and his advisers had realised that the strength of the army on paper and in bayonets meant two very different things. In some degree at least it must have come home to them that instead of the invading army numbering 250,000 men, not half that number were waiting the order to file across the bridge at Simnitza. It cannot have been but that they asked themselves whether the altered conditions did not vitiate the original scheme. Sixty to seventy thousand men might have sufficed to cover the left flank of the advance, to mask Rustchuk, and with the co-operation of Zimmermann to keep in check the Turkish Field Army of the Quadrilateral, if not indeed to drive it out of the field. But half that number, it should have been seen, was too weak for the purpose; nor did it contribute to actual strength to designate as two corps, a body of soldiers only numerically equal to the nominal strength of one corps. The 9th corps and the extras which accompanied it, would have probably been able to cover the right flank after the reduction of Nicopoli, had the nominal strength been at all approximated; but this was not the case. Two corps at their full strength, made up, even with the extras, not by any means an overwhelming host wherewith to cross the Balkans; but how much less overwhelming with the two corps not greatly over, if at all over, one-half their nominal strength! I think most men will admit that a strategic scheme for an army of 250,000 is not likely to suit an army of 150,000. We do not drive a pony in the vehicle built for a dray horse.

If the Russian leaders had recognised the necessity for an altered scheme, they must inevitably have found themselves face to face with the decision between two alternative schemes. One, and the safer one, involved the necessity of abandoning, for the time at least, the trans-Balkan expedition, and the concentration instead, of all the Russian energies on the enterprise of clearing of hostile Turks all Bulgaria north of the Balkans. This was probably *intra vires* of the Russian armies, except that Schumla would scarcely have been mastered, and that Rustchuk might have held out. There would have been the risk of molestation by Turkish columns passing the Balkan defiles and taking the offensive on the northern slopes; but then to persuade Turks to take the offensive in the open field is all along what the Russians have ardently desired. The alternative was much bolder, involved serious risk, and demanded vigilant and even brilliant generalship. I believe that granting these postulates, comparatively weak as the Russians were at the crossing, the Archduke Nicholas might have reached Adrianople by the middle of August with 60,000 men, had he fortified the bridge-head at Sistova, placed the Roumanians in garrison there and at Nicopoli, fortified and garrisoned Tirnova, and left a mobile army of fifty thousand men under a general of the right stamp, on the line of his communications half way between Sistova and Tirnova—say in Gorni Studen and Gorni Lubnica; this army to be reinforced with all speed by every available man and especially by cavalry, and to keep touch assiduously by means of its cavalry with the hostile armies on either flank, its general to watch his chances, and strike in detail, sharply, swiftly, and decisively. No one who has,

studied the campaign of 1814, on the Seine and Marne, can doubt the possibility of the successful maintenance of the Russian communication within a more limited area to defend, and against enemies certainly not so formidable in the field as Blucher and Schwartzenberg. Duke Nicholas's main difficulty would have been to have found the general equal to a task demanding real military genius, self-reliance, and above all self-control. Could he have borrowed Prince Frederic Charles, I believe he might have marched on Adrianople with an easy mind.

As it was, the original scheme was adhered to, at least as far as circumstances permitted, and success was thus rendered virtually impossible unless the Turks were to prove more utterly despicable adversaries than even the meanest of their antecedents warranted the anticipation. That scheme, moreover, was carried out with a sluggishness which is inexplicable, except on the double hypothesis that the Russians having made good the crossing of the Danube, were not yet in a condition to avail themselves swiftly of their advantage; and further that they regarded speed as of comparatively little consequence, by reason of the belief that they had succeeded by other than strictly military expedients, in averting the risk of serious opposition.

It was on the 27th June that the crossing at Simnitza was effected. It was on the 30th that the bridge was completed, and that the cavalry in force began to cross. Bjela is five hours' easy ride eastward from Sistova. It was not until the 5th July that Arnoldi's dragoons crossed the Jantra and occupied tentatively the heights above the town. Tirnova is ten hours' easy ride from Sistova. It was not until the evening of the 6th of July that Gourkho's cavalry found themselves within striking distance of Tirnova. Nicopoli is about the same distance from Sistova as is Bjela; three marches of ten miles each. It was not until the evening of the 12th July that Krüdener found himself before or rather behind the time-worn crumbling fortress. The 8th corps, designed to follow Gourkho's cavalry and head the main column of advance over the Balkans, crossed the Danube on 27th June. It was not till the 9th of July that it quitted the neighbourhood of Sistova on its slow, gentle, march into the interior. Up till that day only one regiment of the Army of Rustchuk had crossed the Jantra; Krüdener with his 9th corps had barely cleared the bridge at Simnitza. These it must be allowed are not brilliant performances.

I marched with the so-called "Army of Rustchuk," and will briefly detail its progress. Leaving Sistova on the afternoon of the 4th July about sundown, I found one of the divisions of the 13th corps encamped in a valley at Sarivar, about ten miles on the main road to Bjela. The Russians camp in tents of the French *tente d'abri* pattern, but larger; six men lying crosswise occupy each tent. There are no sanitary arrangements, and after a single night's occupation, a Russian camping ground becomes an abomination. The soldiers are fairly rationed, receiving daily three pounds of wholesome black bread per man. The meat ration of a few ounces goes to the great kettle in which soup is made with cabbage and other vegetables twice



a day for fifty men. The men with canteen in hand are marched to the cooking-place, and each man gets a ladleful into his pannikin. The cooks are good foragers for the soup, and I have never seen Russian troops utterly rationless except during forced marches or long sustained fighting. Neither at the entrance to nor the exit from this camp was any guard maintained; all and sundry passed unchallenged, for there was no sentry to challenge them. Some Russian divisions maintain a cordon of sentries around at a distance of from one to three hundred yards, the object of which is not very apparent. It is too close to prevent surprise, too close also to hinder spies from doing their work. In fact, watch and ward can scarcely be said to be practised at all by the Russian armies. The German institution of the double post is unknown; there are no sentries as with the Germans at the entrance and exit of villages. I have never known a watchword given out or demanded except in the immediate vicinity of the Emperor's head-quarters. I have crossed the Simnitsa bridge at the dead of night without being challenged, without, indeed, even seeing a sentry. Except by the sentries of the cordon drawn athwart the front of the Imperial head-quarters next to the enemy, I never in all my experience was asked by a man on guard to show my papers. I have had in broad daylight to verify myself in this way three times in entering a village occupied by the Emperor, and I have left the same village in the dead of the following night only seeing one sentry, and he lying sound asleep.

Passing through the camp of the infantry I accompanied a convoy of carts travelling onward without escort and without guide, till midnight found us unchallenged in the heart of a Cossack regiment, whose Colonel told me there were no Russian troops beyond, except one of his own squadrons in a hollow a few hundred yards beyond his left front. He had no night guard, no picquets, no patrols; it would have been mere child's play to have surprised him. Next morning I accompanied General Arnoldi's march at the head of a dragoon regiment upon Bjela. The column marched over hill and through vale with an ordinary advance guard; no scouts pioneered the way, no flankers ensured the lateral security of the march through a region that had not even been patrolled. There actually were hostile troops on the heights above Bjela; but these not having shown themselves in the first instance, Arnoldi, instead of holding the bridge till infantry should come up, and merely sending patrolling detachments across the Jantra to feel for the enemy, who it could not be doubted were near, crossed the river and camped on the heights above the town. Next day the enemy showed in force, and Arnoldi being destitute of infantry supports fell back his main force behind the river, merely holding the heights by a thin fringe of picquets who had orders to retire if attacked. The Turks had no enterprise, and it was fortunate indeed for Bjela, compromised as it had been by Arnoldi's rash advance and its consequences, that this was so. For days the mass of the infantry of the two corps composing the Rustchuk Army remained behind the Jantra, restrained from crossing by peremptory orders from the great head-quarters; their cavalry meanwhile being



about a short day's march in front of the river, and not allowed to undertake any enterprise. The reason for this inaction is difficult to discern. If the object was to protect the left flank of the advance, one fails to see how this end was promoted by the retention of four divisions massed in the dead angle between the lower Jantra and the Danube. It was scarcely to be expected that a force of but forty thousand could at once mask, much less besiege, Rustchuk, and seek out, find, and fight the field army of the Turkish Quadrilateral. As little could it undertake the task of sitting down before Rustchuk for a deliberate siege of that place, and leave the Turkish field army free to operate in its rear, or free for the other enterprise of traversing the Sistova-Tirnova line of communications. To the feebleness of the Russian numerical strength, and their adherence in principle to the lines of a plan designed for a much larger force, must be attributed this strange temporary stalemate of the so-called "Army of Rustchuk."

On the 17th of July the head-quarter veto on the advance of the Cesarewitch was taken off, and on the 18th he crossed the Jantra. Why was the prohibition removed? For one thing, a day or two before, the 11th corps had crossed the Danube, and had its march ordered to the region between Osman Bazar and Tirnova, thus affording some of the much needed cover to the left flank of the advance on the Balkans. The 8th cavalry division continued the alignment further north, till it was taken up along the Lom down to the Danube by the cavalry divisions of the 12th and 13th corps. And so the infantry of the Rustchuk army moved forward, heading for Rustchuk, till its foreposts, cavalry, infantry, and artillery huddled together, touched the Lom. Its front was so narrow that three infantry divisions were jammed into the narrow angle, not more than six miles across, between Pyrgos on the Danube and Kosovo on the Black Lom. The cavalry reconnaissances that were made, scarcely deserved the name. One penetrated to Kadikoi, and was caught in an ambush by the Turks. There was a strangely helpless lack of enterprise, and no attempt was made to find where the Turks were really in force.

But by the staff of the Cesarewitch, the dispositions were assiduously being mapped out for the investment of Rustchuk. I myself saw the environing semi-circle from the Danube to the Danube marked in blue pencil on the staff map. The 26th of July was the day actually fixed for the movement to take up the new positions so detailed. Now, pray consider what meaning lay below the surface of such an evolution. What lay above the surface is patent enough. Some 40,000 infantry were about to invest, with a line attenuated by reason of the front to be covered, a position or rather series of positions of great natural strength, further strengthened by the spade-work of the best part of a year, and profusely armed at every point with, perhaps, the best fortress guns in Europe. This investing army had not with it the rudiments of a siege train; no Russian piece larger than a field gun was on the Bulgarian side of the Danube; I question if there were five score shovels in all the army of the Cesarewitch. And in taking up this investing position, that army was deliberately to

turn its back on a Turkish Field Army of unknown, but unquestionable of considerable strength, leaving to its three cavalry divisions the double duty of covering its own rear, and guarding from a Turkish attack, the line of communication of the Russian Sistova-Tirnova advance. The enterprise seems quixotic, does it not? Allow a fortnight for the advent of the siege train, and a month at the shortest for the subsequent reduction of Rustchuk, was it not lunacy to suppose that the Turks would not have forced the raising of the siege long ere three weeks had expired?

But sage men—among them Dochtouroff, to my mind the best Russian Officer I ever saw—were deliberately bent on the operation of investment. Openly and significantly the striking of a *coup-de-main* was talked of, the loss of a few thousand men, and *voilà tout!* A *coup-de-main* against fortified positions behind fortified positions, against redoubt flanking and commanding redoubt, against thickly-studded batteries of Krupp 24-pounders! A *coup-de-main* of a kind indeed; a few thousand men sacrificed for the sake of appearances and to screen a reputation; the golden key would have been turned in the gate of Rustchuk, and the double eagle would have waved on the summit of the Levant Tabia. But on the 25th of July came a short peremptory order from the great head-quarter in Tirnova to the head-quarter of the Cesarewitch in Obertenik, in the curt terms, "Stand fast!" No reason was assigned. Outsiders at the time believed that the impending stroke at Plevna gave the key to the injunction. It may have been so; but it is a singular coincidence, and I may add a fortunate coincidence, for the Turks, that a day or two previously, the Pasha commanding the Rustchuk garrison was summarily deprived of his position, and another chief appointed in his place.

From the paralysis of that brief peremptory order, the so-called Army of Rustchuk has never recovered. It has never justified its name. Its fortunes have been varied, but it has always been on the defensive, or at best on the offensive with the sole view to a better defensive. Its *metier* has been that of a palisading along the left flank of the area occupied by the Russians in Bulgaria. It has been roughly handled; what triumphs it has had, have been but the recovery of lost ground. To-day its forepost line is substantially on the same ground it occupied in the last week of July. That forepost line is thickly studded with the graves of Russian soldiers who have died to no purpose. I need concern myself no more with the "Rustchuk Army!"

Well-timed audacity can hardly be called the attribute of many Russian generals. For the most part they are so assiduously engaged in feeling their own rear, if I may use the expression, that they have little spare attention to devote to the task of striking boldly at an opponent. Gourkho is the only chief of the European campaign who proved himself capable of daring greatly. His crossing of the Balkans I venture to describe as a masterpiece of bold strategy, wherein the difficulties of the enterprise and the value of the object justified an audacity that superficially appears reckless. That Gourkho, with barely a division of horsemen and a mere handful of riflemen, succeeded,

in getting so near Adrianople as Karabunar, is the strongest testimony at once to his soldierhood and to the comparative ease with which a Russian force might actually have reached Adrianople, if only moderate support had been accorded to the daring leader of the Guard cavalry. But how numbing was the paralysis affecting the general staff may be gathered from the fact, that, although the head of the 8th corps actually co-operated with Gourkho in opening up the Shipka Pass, and although the whole corps was at the time within two days' march of the foot of the Balkans, not more than a single regiment of Mirski's division ever descended the southern slope so far as the nearest villages of the Tundja valley. I know of nothing that hindered Radetsky from pushing on in support of Gourkho, and backing the brilliant fortune the latter had opened up for the Russian arms. But whence, it may be asked, would have come the supports for Radetsky, since one corps was surely scarcely strong enough to back up Gourkho? Good heavens! the famous "physiological moment" was all but compassed; one vigorous effort, the abandonment for once of obsolete ideas and obsolete tactics, and that moment had struck! Surely for such a result the "palisading policy," as I venture to style it, might have been at least temporarily abandoned. Surely the army of the Cesarewitch might have been fetched up out of that useless dead angle down there—that stalemate on the Rustchuk road—and set the task of keeping open the communications between the Danube and Tirnova. For the time at least Krüdener might have held the line of the Osma, passively confronting Osman Pasha entrenching himself in Plevna. Then the 11th corps, instead of being diverted to do palisade duty, would have been free to follow the 8th across the Balkans, and the 4th, which in the event turned aside to Plevna, would have been available to follow in support.

But the Russian General Staff were incapable of rising to a sense of the wisdom of playing a bold game for a big stake. They assiduously lined a thoroughfare which, by reason of their lack of enterprise, led for them to nowhere. Gourkho's expedition ceased to have a rationale when he was ordered to fall back, or rather, to put it bluntly, when the gallant cavalry man was abandoned to his fate. Nay, more; in virtue of this *fainéant* resolve, Gourkho's expedition was degraded into a piece of sheer wantonness; and the full responsibility of the shudderingly terrible episodes that were the incidents of Gourkho's advance and followed with fell swiftness on the heels of his retreat, must rest with all its blood-curdling onus on those who decreed the raid and then recalled it. But such considerations are outside my theme. I have only to add with reference to Gourkho's expedition that it is perhaps more fertile in practical lessons to the student of the art military than any other section of the war in Europe.

Krüdener's delay in reaching Nicopoli was occasioned mainly by the circumstance that, having been engaged in a demonstration opposite to it, he had to march round by Simnitsa, and so back along the southern bank to within sight of the encampment whence he started. His orders were to reduce Nicopoli, and once within striking distance he fulfilled these orders in a most prompt and soldierlike manner. Economy of time was of importance, and he economised it in the only

manner time in actual fighting can be economised, viz., by exchanging men's lives for minutes. Osman Pasha was marching on Nicopoli. Krüdener had lost heavily in the taking of the place. The whole of his corps was not up. I do not believe that after the fight he had 15,000 men under his command. He had to make the place as defensible as possible, and had more than 5,000 prisoners to guard. I think that under such circumstances he could not well have been expected to occupy Plevna in such force as to close it against Osman Pasha. He seems to have done what was in his power, by sending some cavalry there, and indeed by disposing his cavalry division all along the Vid from near Lovtcha to the Danube.

Osman Pasha, finding himself too late to succour Nicopoli, turned aside, drove the Russian cavalry out of Plevna, and sent in his own advance guard to occupy it. Then Krüdener appears to have done what in him lay to avert the misfortune looming, at that time a cloud no larger than a man's hand, over the Russian arms. He sent a detachment to re-occupy Plevna, and followed it up by all the strength he could spare, Schilder-Schuldner's brigade. It was the fault not of Krüdener, but of the numerical weakness of the Russian army, that no stronger force was available. Schilder-Schuldner blundered grievously, and his brigade was all but annihilated; this, however, was a mere matter of detail, for he was neither strong enough to retake Plevna, nor to hold it against Osman Pasha if he had retaken it.

Osman Pasha thus far merits his self-accorded title that he is at least the temporary saviour of Turkey. But for his occupation of Plevna, which, after all, has ever seemed to me a mere happy chance, it is not easy to doubt that long ere this, the Russians would have been at Adrianople. The Russian conviction that—come what might, sacrifice no matter what—Osman Pasha must be driven out of Plevna, has wrecked for them the summer-autumn campaign. I venture to think that this conviction was an error. It is an axiom in war as in most other things, that details are to give place to results. If, in case of fire, you have the alternative of saving a valuable picture, or the far more valuable house which contains it, would you hesitate a moment to declare for the latter, especially if there was a fair chance that in saving your house you should save your picture also?

I have already indicated the alternative line of action open to the Russians after Osman Pasha had occupied Plevna, and was busy strengthening himself there. I think it probable, had they pursued it, a truce might have surprised him in the elaboration of his admirable system of defensive earthworks. But the Russian leaders regarded it as imperative that he should be driven out, and that all progress should be arrested till this was done. Krüdener was ordered to bring up his whole corps against Plevna. A division, the 30th of the 4th corps, which had been intended for trans-Balkan work, was diverted on Plevna, and Schahoffskoy, the general commanding the 11th corps, was ordered to march one of the brigades of his 32nd division—the other was still at Giurgevo—from the remote position of Kosarevac opposite Osman Bazar, athwart Bulgaria on Plevna, taking with him also a

brigade of his cavalry division. Krüdener, as the senior general, had the chief command. There was at his disposal the mass of his own two infantry divisions, the 30th division, a brigade of the 32nd division, his own cavalry division, a brigade of the 11th cavalry division, and Tutolmin's brigade of Circassian Cossacks, and 160 guns. At its full nominal strength of 16,000 men to the infantry division, this force, making a liberal allowance for Krüdener's losses at Nicopoli, would have been over 65,000 strong; on the basis of 12,000 men to the infantry division, and a proportionate deduction in the other arms, it should have numbered about 45,000; in reality its actual strength was barely 30,000 fighting men. I may remark that these data go to prove conclusively my assertion in the earlier part of this lecture as to the weakness of the Russian Army in Bulgaria. On the Plevna figures, if we add to the 30,000, 4,000 for the previous losses of the 9th corps, the strength of a Russian army corps at this stage of the campaign was 19,400 men. There were seven corps and one brigade across the river, which gives a total of under 136,000 men. Add Cossack Division, Tirailleur Brigade and Bulgarians, say 10,000, gives 146,000. But there had been already losses to the amount of quite 6,000 men: there remains, then, a grand total of 140,000 men.

Krüdener, from personal inspection, knew the strength of the Turkish positions about Plevna, and could give a shrewd estimate as to the strength of the army holding that position. Much injustice has been done to this sound old chief in reference to his share of responsibility for the disaster at Plevna. For the wrong I personally did him inferentially, acting on information intended to mislead, I have long since asked his pardon. He had no alternative but to make the attack. His repeated and strenuous remonstrances were peremptorily overruled, he was summarily ordered to attack, he could not resign at such a moment, and he was bound to obey. He did not even hope against hope: he recognised the inevitable too surely. The responsibility for the disaster of Plevna on July 30th, must rest on the shoulders of Krüdener's superiors.

There was hardly any plan of attack. Krüdener took the north-eastern face of the horseshoe, Schahoffskoy the south-eastern, and the two fell on and doubtless tried their best. It had been arranged that Schahoffskoy should not be categorically under the command of Krüdener, but that if he saw his opportunity to attack, before doing so, he should communicate with the latter and obtain his consent. The accident of position brought Schahoffskoy within what he regarded as justifiable striking distance, while Krüdener was struggling with the adverse conditions of his section of the area of attack; Schahoffskoy threw the compact to the wind, and went in without permission, and virtually without co-operation. It was a terrible error, and might have had ruinous consequences but for Krüdener's greater steadiness and the keeping of his men in hand, so as to show a decent front after the battle was irretrievably lost. But it was a right gallant error, a forlorn-hope style of enterprise; the kind of error for the rarity of which Russian generals may be trusted. At three o'clock, Schahoffskoy's brigades began to feel infantry fire for

the first time in the campaign ; at the going down of the summer sun, Schahoffskoy sent a message to Skobeloff, thrilling in its terrible confession, " Extricate yourself as you best can ; my companies are coming " back five and ten strong ! "

There was no peculiarity to note in the mode of attack. The artillery was handled independently, and with no lack of enterprise. There was none of the obsolete fatuity of conforming slavishly to the movements of infantry. The batteries early took post in mass in a commanding position, and having the power of concentrating their fire ; but I think Prussian gunners would have held that they were retired too early. Mr. Kinglake, in his narrative of Inkermann, describes Soimonoff's infantry as advancing to the attack in " company columns. The three foremost of these columns marching in the " same alignment, and the fourth in rear of the centre." Schahoffskoy's infantry reversed this arrangement. Three companies, it is true, marched in separate columns on the same alignment, but the fourth—the rifle company—marched in advance of the centre. The rifle company of a Russian line regiment is, I may remark, still armed with the same piece—the *Kranke*—as the other companies ; but its rifles are sighted up to twelve hundred yards, their's but to six hundred. In the advance, even before the enemy's fire was felt, the alignment fell to pieces. The rifle company, never extended in skirmishing order, soon lost its advanced position and got mixed up with the centre company behind it ; the advance was rapid, partaking always more of the character of a mob attack than of a swarm attack. Every man did the best he could for himself without reference to his neighbours. The firing began greatly too soon, and without any bugle sound. The scene was that of brave men bent on a common object, but in unmilitary confusion, and if attaining the object at all, doing so at useless sacrifice for want of organization ; for want, gentlemen, of that well ordered control, that order of disorder, that well timed rashness, that equally well timed caution, that can only come to a body of attacking soldiers by reason of the presence of a sufficiency of good officers, commissioned and non-commissioned. How can you expect fire-discipline from year-old peasant-soldiers, whose non-commissioned officers have little, if any greater, training than themselves, and with a field average of three and a half officers per company of two hundred men ? Gentlemen, I am diffident in the face of this assemblage of soldiers, but on this point I will be bold. For better or for worse we have now an army of boys. Take the word of a man who has seen much fighting both by trained and untrained soldiers. It behoves us, if we would escape disaster in the hour of trial, to take such means as will induce our non-commissioned officers to remain under the colours and not go forth into civil or quasi-civil life. And yet more incumbent on us is it to listen to no argument of theory that would reduce the number of our commissioned officers. Our army is so small, that more than any other, for the sake at once of judicious daring and of judicious economy of life, it must be well, brilliantly, and carefully led. And this cannot be when sparse officers are whelmed in a confused mob of men.



After the July battle of Plevna, the Russians, with the resources at their disposal, had no alternative but to desist from active prosecution of the war until the strength of Osman Pasha should have been broken. Their honour forbade that he could be any more ignored; equally was this rendered impossible by his increased strength in proportion to their increased weakness. The condition of the Russians was extremely precarious. Mehemet Ali Pasha was menacing in force (with a mobile army resting a flank on a fortress) the long attenuated line of their left flank. Osman Pasha might take the offensive any day, and there could be no assured confidence that the army of Zottoff and Krüdener could hold its own against him. Reinforcements in any strength were not at hand; during the month of August only six brigades of infantry and a few regiments of cavalry crossed the Danube into Bulgaria. No man can say what would have been the issue, if the Turks had boldly taken the offensive in the first week of August. I believe the Russians would have had at least to concentrate round Sistova if Suleiman Pasha, instead of braining his army on the rocks of the Shipka, had crossed the Balkans by the defile of Kazan and the Iron Gate, and joined his forces with those of Mehemet Ali. But the Turks did not move in earnest, and the Russians doggedly held on, adhering even with wonderful pertinacity to the key to their original project—the Shipka Pass. From the 21st to the 26th of August their grip of that position was very sorely strained. Some men said that the game they were playing was not worth the candle; with a hard dry winter and Plevna once fallen, they may chance to do justice to the reason for the pertinacity of the Russians in August. But what a struggle they had, with scanty forces to hold the wide area they had laid themselves to hold, and the multiplicity of threatened inroads thereupon! The Russian Army in Bulgaria at this time was like a man inside a barrel honey-combed with leaks, and with only a single pledget of oakum. Now he is stuffing this orifice, anon he must withdraw his pledget from that, and scramble to stuff another; there is not a moment's rest for him. To and fro, from Plevna to Kosarevae, from Kosarevae to Elena, from Elena to the Shipka, from the Shipka back to the left flank, Russian battalions were hurried by forced marches. Want of system, and a certain gasping nervousness of direction aggravated the troubles of the situation, which at the best was precarious enough. I shall never forget the emphatic exclamation of the Grand Duke Nicholas when on my way through the head-quarters after the Shipka fighting of the 24th August. I ventured respectfully to suggest to him that he should treat the positions there as a sort of leviathan picquet, and keep an army corps as its defence; three brigades always within hail in and about Gabrova, and one brigade, regularly relieved, on duty on the exposed position. "My God!" he exclaimed, "where am I to find an army corps? I have 'not a spare battalion!'" It is the best tribute to his stout soldierhood that under conditions so adverse, he hardened his heart and held manfully to his ground.

The September attempt on Plevna differed in essentials but little from that of the 30th July. The Russians had gathered for it a larger force; perhaps, including the Roumanians, nearly 75,000 men were



engaged. They had more field artillery, of course, and they had also brought up twenty siege cannon, which were of no material effect against the massive earthworks of the Turks. They preceded the infantry assaults by five days somewhat intermittent preparation of artillery fire, and the face of their assailing position embraced a larger proportion of the Turkish horse-shoe than in the July effort. If the force which essayed the task in September had been engaged in the effort of July, probably success would then have crowned the Russian arms. In July, be it remembered, Osman Pasha had but no more than some ten days in which roughly to intrench himself; but, in the six weeks' respite which intervened, he had been characteristically industrious, so that the increased attacking force in September was quite counterbalanced by the increased strength of the defences. There was nothing special about the September effort. For five days the Russian artillery pounded away at the Turkish earthworks, the Turkish guns replying in an easy *nonchalant* style, the Turkish infantry keeping well out of sight and out of danger. On the 11th of September, the miserable afternoon of the fifth day of the bombardment, assaults were delivered at three points. The Roumanians, with Russian battalions interspersed, went at the Grivica redoubt, and, after hard fighting and several repulses, at length carried it; the 16th Division assaulted the redoubt on the isolated mamelon due south of the town, and although they came on dashing a second time, after one repulse that would have been enough for most troops, they had to abandon the attempt, and were roughly handled by the Turkish pursuit, as they were falling back. Skobeloff, the younger, on the other side of the Lovtcha-Plevna chaussée, carried three outlying redoubts, and could have held them, although the holding of them would not have opened the road to Plevna, but that he was refused reinforcements, and had to withdraw. So this attempt gradually became comatose, and it became apparent that the place was too strong to be taken by assault. We all know the alternative procedure which has been adopted, and which seems to bid fair to be successful. I would, with all caution, refrain from prophecy, but there can scarcely well be doubt that, suppose Plevna to fall in December, and the winter be hard and close, of which there is now every prospect, there can interpose no very serious obstacle to hinder a large Russian army from crossing the Balkans by the Shipka Pass. In war, the weight generally tells sooner or later.

In conclusion, I would point out how little the Turkish method of fighting has changed since their wars which preceded the commencement of the present century. In his remarks on the long series of Ottoman wars, closing with 1811, Major Frank Russell, in his valuable volume, "Russian Wars with Turkey," says, "What strikes one in reading the history of these wars is the extraordinary manner in which both sides alike made use of entrenchments; the Turks more especially appeared to regard the spade as their most valuable weapon; in place of rapid manœuvring and skilful combination, they had no thought of anything but moving to a position, then fortifying themselves and making subsequent sorties. The Ottomans, whether regular troops, irregular, or untrained inhabitants, have always

"fought brilliantly behind entrenchments; in fact, they seemed especially to rely on this quality as their strong point and safeguard. The wars not unfrequently were little else than a succession of sieges, in which the Russians often had the worst of it." Substitute for the word "sieges" the phrase "investment of position," and you have the present war described in *petto*.

## SPECIAL LECTURE.

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Friday, December 7, 1877.

GENERAL SIR RICHARD WILBRAHAM, K.C.B., in the Chair.

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### ON THE CAMPAIGN IN ARMENIA IN 1877.

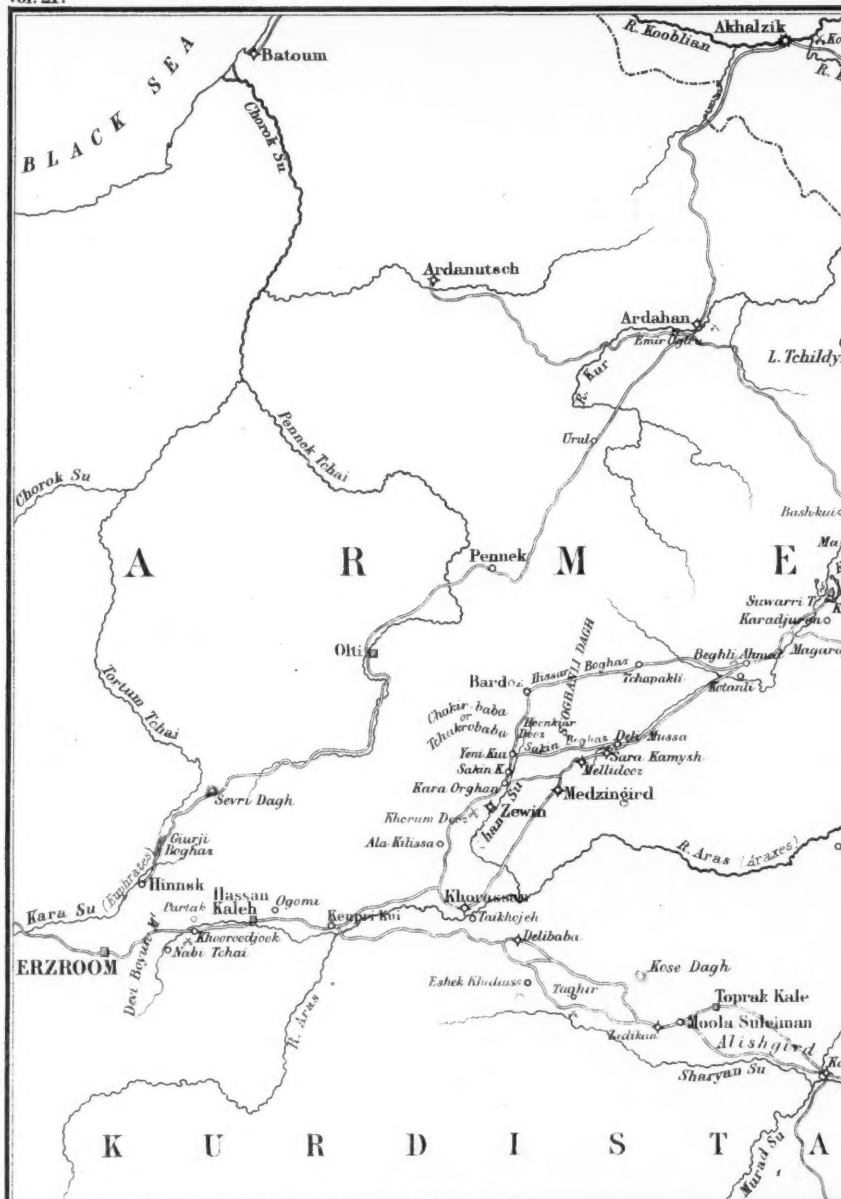
By C. B. NORMAN, Esq., late *Times* Correspondent at the Seat of War.

It was with no small diffidence that I accepted the very flattering offer of the Council to deliver a lecture in this theatre on the Campaign in Armenia. A novice in the art of war, it seems absurd that I should venture to tread on professional ground in the presence of professional men who have made that art their study; but when General Stephenson was good enough to assure me that my experiences would not only be interesting to the many but might prove instructive to the few, I felt that it was a duty, as well as an honour, to accede to his request. I felt, too, that the courtesy extended to my comrade, Mr. Archibald Forbes, and to myself, marks an epoch in the history of Special War Correspondents, and proves, that although at times we may be considered the "curses of modern warfare," yet that when our side is not in, we are welcomed and appreciated by the Officers of the British Army.

It is not my province, nor is it my intention, to enter into a disquisition on the causes of the war. Our country, as I have no doubt you also, gentlemen, are, is divided on the subject of the Eastern Question; one party appears to consider it perfectly fair and justifiable to enforce Christianity at the point of the bayonet; another, aghast at such a doctrine, deems it necessary for the support of British interests to uphold, at all cost, what appears to many a corrupt, decaying empire; whilst a third, steering clear of these two extremes, maintains that a war between the Moslem and the Slav no more endangers our communications with India in 1877 than it did in 1829. I think, however, all are agreed on one point, and that is, that when England's honour is assailed her interests are in jeopardy, and that she is better prepared now than she ever was before to defend them.

For my own part, I shall endeavour to give you an impartial, unbiassed description of the campaign, dwelling more particularly on those points that came under my own particular observation. Prior to this, I will, with your permission, briefly run through the war of 1828-29. In doing so I am aware that I shall be travelling over,





Reduced from the Russian Staff Map. For the sake of clearness the mountains are omitted.



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ground lucidly explained to you in a recent lecture by the Chairman. It may be that some here were not present on that occasion; however, at the risk of repeating much that you have been told before, I will glance at Paskiewitch's operations, for I think that in comparing the two campaigns we shall find several points worthy of notice. We shall find that in spite of an interval of half a century, during which the campaign in Armenia had doubtless been carefully thought over, and plans for its successful accomplishment pigeon-holed in the War Office in St. Petersburg, in spite of a peace of twenty years, during which we certainly thought she was preparing for war, Russia has failed to profit by the lessons taught in her great campaigns of the past decade, has adhered to her ancient tactics, has committed the same mistakes in 1877 that she did in 1829, has been defeated by her old foe on the ground on which she was victorious fifty years ago; and, finally, only with a supreme effort, has succeeded in accomplishing that which all the world, a few short months ago, thought would be a mere military promenade. I think that this is a lesson England may well lay to heart; it may be summarised in a few words—undue depreciation of the qualities of an enemy.

To turn, then, to Paskiewitch's campaign. On the 8th of December, 1827, Russia being then engaged in hostilities with Persia, war with Turkey was declared. Hastily concluding peace with the Shah, the Russian general turned his thoughts to the conquest of Armenia and reduction of the Ottoman ports of Poti and Batoom. For this purpose he determined on three distinct lines of operations.

1st. On the Black Sea coast.

2nd. Via the Allaghoz Mountains into the heart of Armenia.

3rd. By Ararat, and the course of the Araxes for the same point.

The intentions of Persia, notwithstanding the recent treaty, were not quite understood, so a corps of observation was established on that frontier at Khoi. The Russian plan necessarily included the reduction of the fortresses of Ardahan, Kars, Akhalzik, Hertwitz, Akhalkalaki, and Bayazid, before crossing the Soghanli Dagh. The Turks, under Halib Pasha, busied themselves throughout the winter in strengthening the works at these places, reinforcing the garrisons, organizing into irregular regiments the inhabitants of Lazistan, Koordistan, and the Karapapaks of Shoreagel. They, too, mobilized an army of 40,000 men on the Soghanli Range, with the intention of striking a blow at any force advancing either from Erivan or Alexandropol. They also fomented an insurrection amongst the Abkhasian and Mingrelian tribes in the Caucasus.

It was not until the 12th June that Paskiewitch crossed the border at Goomri, and moving rapidly to Magardjik, commenced the bombardment of Kars on the 20th; on the 23rd it was taken by assault. 151 guns and 11,000 men being captured with it. Leaving a strong garrison in the place, the Russian General advanced by Zaim and the eastern shores of Lake Tchildir to Akhalkalaki, which, on the 24th July, was assaulted and captured. Detaching a column under General Sacken to Hertwitz, that place surrendered on the 26th of the same

month; the same day reinforcements reached the Russians from Tsalki and Goomri, and hearing that a Turkish army 30,000 strong is advancing from Ardahan, Paskiewitch moves towards Akhalzik to meet them, and a battle ensued on the 9th August, at Koltshikin, the junction of the Kur and Kooblian rivers. The Turks were driven out of their entrenched camp with a loss of ten guns, and fled in disorder to Ardahan. Paskiewitch the following day invests Akhalzik, which was assaulted on the night of the 15th August, and capitulated the following day. In the meantime General Bergmann, from Kars, had been directed to advance on Ardahan, and Mouravieff was now detached from Akhalzik for the same purpose. Before these forces could unite, it surrendered to Bergmann on the 16th August.

In the meantime the right column under General Hesse had captured Poti, with 43 guns and 2,000 men, whilst Prince Tchavtzavadzi, with the left column, had subjugated the province of Bayazid and pushed on as far as Toprak-kale. Here, being threatened by the Pasha of Moosh, he is strengthened by two battalions from Khoi, and feeling that his communications are insecure as long as the citadel of Bayazid is in Ottoman hands, he retires through Dijadin, and attacks a large body of Koords, who cover the place. These being defeated, Bayazid capitulates on the 28th August. Anxious to obtain fresh supplies, Tchavtzavadzi once more enters the Alishgird plain, and after a sharp engagement at Grakom, having effected his purpose, though much harassed by Koords in his rear, the column retires.

Paskiewitch, feeling that his forces are not strong enough to risk an advance across the Soghanli Dag, now cantons his men as follows:—

Akhalzik..	2,300	infantry,	326	cavalry,	4	guns,	under	Bebutoff.
Kars ..	2,400	"	281	"	12	"	"	Bergmann.
Bayazid ..	8,800	"	376	"	18	"	"	Pankratieff.

The remainder returned to winter quarters in Russia. Thus Paskiewitch had no reason to be dissatisfied with the success of the campaign. In five months he had subjugated the provinces of Poti, Kars, Akhalzik, and Bayazid, he had captured three fortresses and three smaller fortified towns, whilst 313 guns, 195 standards, and 8,000 prisoners were brought back to Russia, and his losses amounted to 3,200 men out of a total of 18,000 employed in the war.

During the winter, the Osmanli redoubled their efforts to save the province, the old commanders were disgraced, and Salegh and Hakki Pashas nominated in their places. The plan of operations these men decided on was to advance direct on Kars by the Soghanli with an army of 80,000 men, whilst a second of 50,000, advancing from Van, was to recapture Bayazid and move on Erivan. Emissaries were again dispatched to stir up insurrection in Ghuriel and Abkhasia, and a force of 20,000 men sent to recapture Akhalzik. Mouravieff advances to its succour, and after a sharp engagement on the 28th February the Turks are defeated and the place relieved, not, however, before they massacred all the Christian inhabitants of the town.

General Hesse in the meantime suppressed the insurrection in Ghuriel with a loss of 137 men.

On the 19th May Paskiewitch, hearing that the enemy had 50,000 men near Hassankali, rejoined head-quarters at Akhalkalaki and prepared to resume the offensive. A corps under Mouravieff was detached to Akhalzik. Pankratieff at Bayazid was directed to send a force to Karadjuren, near Kars, whilst Paskiewitch, foreseeing the relief of that fortress would be the first object of the Turks, placed himself at Beghli Ahmed. Early in June it appeared that the Osmanli had taken up their position in two columns, one under Salegh Pasha at Zewin; a second, under Hakki Pasha, at Mellidooz. On the 11th Paskiewitch advanced from Kotanli, masking his design by threatening Hakki Pasha's front, moved his main body down the Sakin Pass, cut in between Zewin and Mellidooz, and on the 19th, descending from the Tehakirbaba *viâ* Kainley, attacked Salegh Pasha on the very spot the battle of Zewin was fought on, on the 25th of the same month this year. Hakki Pasha, threatened in front by Burstoffs column at Sara Kamysh, dared not come to the assistance of his chief, who was signally defeated, losing 12 guns and 2,000 prisoners. The following day, the 20th June, Paskiewitch, moving by Kara Orghan, took Hakki Pasha in rear, capturing 15 guns and the Turkish commander with 700 prisoners. The Russian General at once follows up the Turkish army, passing through Kuipri Kui on the 23rd, occupied Hassan Kale on the 24th, where he finds 29 guns; on the 25th he encamps on the Nabi Tchah, and on the 28th Erzeroom is surrendered. Later on, the Russians advanced towards Trebizond as far as Baiboort; but the peace of Adrianople in August stopped all further operations. The frontier was rectified by an International Commission, Erzeroom, Kars, Ardahan, and Bayazid were evacuated, and the Russian army moved back to Georgia.

To turn now to the operations of the present campaign. War was declared on the 24th April last, but for many months previously it was well known that it could not be long deferred, and both nations made every endeavour to meet the coming storm.

The Turkish organization is perfectly powerless for offensive purposes, though admirably adapted for defence, and thus the Porte turned its attention to strengthening the fortresses barring the road to Armenia. For this purpose, cargoes of heavy Krupp guns were dispatched to Trebizond for transport to Ardahan, Kars, and Erzeroom, but so dilatory was the Seraskierate that the first consignment only reached the eastern coast of the Black Sea after the declaration of war. None were in time to take part in the defence of either Kars or Ardahan. The Porte also determined to adhere to the plan of causing a rising in the Caucasus, although well aware that both in 1828 and in 1855 this movement, whilst denuding Armenia of many men, had no effect on the results of the campaign.

The frontier line, commencing from Fort Nicolai on the Black Sea, runs in a south-easterly direction to the Arpa Lake, then following the course of the Arpa River until it joins the Aras, where it juts forward in a wedge-shaped course to the west as far as the Aghri Dagh Mountain, whence, turning easterly, it skirts the northern shores of the

Balikly Lake, and runs to Ararat, where the Russian, Persian, and Turkish frontiers meet. The line between the two former states, then runs in an easterly, while that between the two latter states takes a southerly, course.

The plan of the Russians, it was surmised, would be similar to that followed in 1828-9, viz., one column, operating on Batoom, would endeavour to seize that port and to cripple the insurrection in Abkhasia, another would undertake the capture of Ardahan and Kars, whilst a third would operate on Bayazid and the line of the Aras.

This surmise was strengthened, because, during the winter, it became known that corps were being mobilised at Kutais, Akhalsik, Alexandropol, and Erivan. The chief command of the army was vested in the Grand Duke Michael, but the actual director of operations in Armenia was one Loris Melikoff, an Armenian of the princely house of Mellian.

The following were the details of their force :

1st. The 40th division assembled at Kutais for the purpose of operating against Batoom. It was commanded by Lieutenant-General Oklobjia. It consisted of 16 battalions of infantry, 6 batteries field artillery, and 2 regiments of Cossacks ;

2nd. The main army under Melikoff was mobilised at Alexandropol, and comprised the division of the grenadiers of the Caucasus, the 20th and the 39th divisions, with a division of cavalry, a brigade of sappers, and the brigade of rifles of the Caucasus.

3rd. At Erivan the 19th and the 38th divisions were massed with a complete division of cavalry and 96 guns.

This army nominally consisted of 90,000 infantry, 15,000 cavalry, 2,500 sappers, and 290 field guns, whereas, I am assured on most excellent authority, that at the time of invasion it did not exceed half that number.

I must own, I was not very much surprised, after the relief of Kars, to find that the Russian strength had been much over-estimated. In my journey through Europe to the Asiatic seat of war, I had the pleasure of travelling with Lieutenant-Colonel Stracey, of the Scots Guards, who had been spending his leave in the Russian and Turkish camps, on the Pruth and the Danube. Amongst other valuable information that that officer was kind enough to furnish me with was this, that the Russian army in Europe was just about half the strength it was reported to be. I found Colonel Stracey's estimate equally applicable to the Asiatic army, which numbered 50,000, not 100,000 men. Brag is a good game to play if it frightens your enemy out of the field ; but if they enter it fully prepared to meet 100,000 and find they have only 50,000 opposite them, it generally turns out awkward for that 50,000, and the early part of the campaign in Europe, as well as in Asia, I think demonstrated to the Russians the weakness of their hand.

The Turks, on the other hand, preparing for defence, massed their forces principally in the fortresses on their frontier line. Thus they had—

Batoom 30 battalions					
Ardahan	12	„	....	86 siege guns. ....	3 batteries.
Kars	38	„	....	217 „ ....	8 „
Bayazid	3	„	....	0 „ ....	2 „
Van	6	„	....	0 „ ....	2 „
Erzeroom	13	„	....	150 „ ....	6 „

whilst at Olti, as a connecting link with Ardahan, were 6 battalions and a mounted battery; between Erzeroom and Kars 2 battalions, and a battery at Gulentab and Khagisman, 2 battalions; and at Delibaba and in the Alishgird Plain, kept in open communication with Bayazid, were 12 battalions, 2 field and 1 mounted battery.

Thus, leaving Batoom out of the question, which was a separate command, garrisoned by men from the coasts of the Black Sea, not from the Armenian army corps, the Turks had in April but 92 battalions, with 24 batteries, 11 only of which were horsed, and 3 regiments of cavalry. Whereas, according to the authorised constitution, the 4th, or Armenian army corps, should consist of 120 battalions, fully officered, and a force of 199,000 territorial soldiers, formed into battalions, it is true, but without officers. Of these 120 battalions, 24 only consisted of Nizam or regular regiments, drilled, disciplined, equipped, and officered; of the remainder, 48 belonged to the Redif or reserve troops, and 48 to the Mustahfiz or enrolled territorial army. These latter, at the outbreak of the war, were found to be absolutely without officers; so sergeants and corporals of the Nizam corps were hurriedly appointed captains and lieutenants of Redif and Mustahfiz battalions, and certainly, as far as I was able to judge, most injudicious selections were as a rule made.

The artillery, which certainly is the best branch of the service, was armed with Krupp's steel breech-loaders; the horse-artillery with 4-pounder guns, which have a calibre of 3.42 inches, and weighs, with limber complete, 3,960 lbs. The field batteries, some few of which still retain the smaller gun, are generally armed with the 6-pounder Krupp, which has a calibre of just 4 inches. The mountain guns are, as a rule, Krupp's bronze  $2\frac{1}{4}$  inch rifled pieces, carrying what I believe is technically known in our batteries as a 7-lb. shell. All batteries have the same number of guns and the same number of officers, viz., one captain and two lieutenants. Horse batteries have 164 non-commissioned officers and men; field and mountain batteries 162 and 107 respectively. These batteries form a battalion, commanded by a Bin-Bashi, or leader of a thousand. Four battalions form a regiment, the first being composed of horse, the other three of field batteries. This is commanded by a Liva Pasha, or General of Brigade, who has a Colonel, a Lieutenant-Colonel, a first-class Veterinary Surgeon, and thirteen junior Officers on his Staff. All guns are drawn by six horses; and, what struck me as peculiar was that, in Asia, there was but one ammunition waggon with each battery, the remainder of the ammunition being carried on arabas or country carts, or on mules or pack-ponies, which, of course, were never to be found when wanted. There was a forge with each battery, but the dearth of artificers

was a common cause of complaint, the majority of these men being in the arsenals of Kars or Erzeroom.

The mountain guns were generally carried as in our own Indian mountain batteries, on the backs of mules, but when the ground permitted it, the gun was mounted, and the carriages, being provided with a pair of shafts, was drawn by one animal, as the mules were generally fine beasts of from 14.1 to 14.3 hands. The effect was rather absurd.

Of garrison artillery there were 1,500 in Kars, 400 in Ardahan, and 1,200 in Erzeroom. These were organized into companies of 3 officers and 150 non-commissioned officers and men. The principal siege-guns were the muzzle-loading shunt gun, with a calibre of 5 inches, and bronze guns on Krupp's system, made in the arsenal of Stamboul of 12, 15, and 18 centimètres calibre.

The artillery horses, most of which are country bred, though some are imported from Hungary, are strong useful animals, standing from 14.1 to 14.3, possessing great powers of endurance. They were allowed 9 lbs. of barley and 12 lbs. of grass per diem, but as a rule the quantity of grass was unlimited, and as it was of a necessity green, the condition of the animals was not all that could be desired. The cavalry of the 4th army corps might well raise a smile on the faces of those accustomed to the magnificent appearance of our own regiments of horse; indeed, an A.D.C. of Ali Pasha, the cavalry divisional commander, whom I had previously known as a duffadar in the 4th Punjab Cavalry, informed me privately, that any one of our irregular regiments in India could have "eaten up" the whole of Mookhtar's cavalry, and I well believe him. Nominally there were two brigades of two regiments each in the corps. I never saw a whole regiment together. The squadron is the tactical unit, of which there are six to a regiment, each is commanded by a 1st captain with 5 officers and 155 non-commissioned officers and men. The staff of a Turkish cavalry regiment is a curiosity, consisting as it does, on paper, of 131 officers, non-commissioned officers, musicians, farriers, and artificers, including 9 medical officers!

The horse-furniture is the same as for the gunners of the horse artillery. A saddle of the same pattern as that used in the French Army; a wallet on the near, holster on the off side of the pommel; a valise on the cantle, containing kit; on the near side of saddle attached to it by D's is a nose-bag; on the off side a small water-bottle. The bridle is of the simplest kind, and varies according to the taste and wealth of the rider. Arms consist of a sabre of a curiously useless metal. A Smith and Wesson's revolver, and a Winchester carbine; 2 small pouches, containing 20 rounds each, are worn on the waistbelt. The uniform consists of a short tunic—loose baggy trousers, and half boots.

The battalion, which is the tactical unit of the infantry, consists of 8 companies, of 3 officers, and 98 non-commissioned officers and men; it is commanded by a Bin-Bashi, with 2 half-battalion leaders under him, and 2 medical officers. Four of these compose a regiment, commanded by a colonel, with a lieutenant-colonel, and regimental,



staff, consisting of 80 junior officers, non-commissioned officers, musicians, armourers, &c.

It must be borne in mind that in the Turkish Army, troop and company officers do not hold commissions; they live in barracks, though in separate rooms to the privates, and unless they have great influence, can never hope for promotion; as a rule, sons of Pashas, after passing through the military school, are attached as pupils to one or other of the embassies, and granted commissions as wing or squadron commanders. The consequence is, that the troop or company officer is, as a rule, illiterate, possesses no powers of command, and rarely, if ever, shows fitness for his position, which he owes either to luck or else to gross kow-towing to his battalion commander.

The general arm of the Turkish infantry is the Martini-Peabody, a close copy of our own Martini-Henry, the only difference I could notice was in the shape of the lever; the bayonets were of two kinds—the ordinary sword bayonet, and a four-cornered fluted weapon, somewhat resembling our own. Some battalions were still armed with the Snider. Ammunition was carried 50 rounds in a black leather pouch on the waistbelt, 20 more, in small receptacles, stretched across the breast of the tunic, and 80 in the pack, which, by the way, consisted of a brown or blue cloth great coat, with hood, in which the kit, such as it was, was wrapped up. The men, instead of wearing boots, wore a sandal, made of felt, with a soft leather sole. Their marching qualities were decidedly bad, when compared with either our British troops or native corps in India. Discipline on the march was unknown, and men straggled in the most lamentable manner even in the presence of the enemy. I doubt if such things as kit-inspection, or examination of arms and equipments, were ever carried out. I have opened men's pouches at all times, on the march, going into action, and in action, and never yet saw a full one. In one engagement in which we got a very considerable beating, a man assured me that his battalion went into action with one full packet of ten, and a few spare rounds in their havresack, and yet each battalion had 32 ponies each, carrying 2,000 spare rounds attached to it.

I think this campaign should teach us one thing, and that is, that it will be hard to find a more serviceable weapon than the Martini-Henry—exposed to all weathers, rarely if ever cleaned, knocked and battered about, lock, stock, and barrel generally in such a condition that had the owner been a British private, I feel sure that the captain of his company would not have felt himself competent to adjudicate on the case; the Turkish soldier still clung to it, and had no hesitation in firing off his hundred and fifty rounds, if he happened to have them, although the weapon had not been cleaned for weeks.

There was no organized transport service. Tents and regimental stores were carried on pack animals attached to each corps, whilst commissariat and army stores were carried on arabas or country carts. These were pressed from the neighbouring villages, and as they were not paid their services, being looked upon as a "war contribution," as you may imagine, they were neither zealous nor efficient. Regimental baggage animals were escorted and drawn by detach-



ments detailed from each battalion, from two to three men per mule being considered necessary.

I have omitted all mention of Sappers and Miners; they certainly are considered in the admirable Imperial Regulations for the better government of the Ottoman Forces, published in 1869, but I failed to find a solitary specimen in Armenia; and on my putting the question to the Chief of the Staff, he said, "I am the corps of Sappers and Miners;" he was more, he was the mainspring of the Army.

The command of the Turkish forces was vested in Mushir Ahmed Mookhtar Pasha, who, from the fact that he formerly had been Governor of Erzeroom, knew the theatre of war well. Many years he was an Aide-de-camp to the Sultan Abdul Aziz, and in that capacity visited England in 1867; as Colonel on the Staff, he served throughout the Yeman and Cretan campaigns, for which he was promoted to the rank of Liva, and subsequently Ferik or Lieutenant-General. Court influence procured him the Mushirlik of Erzeroom. He was a particularly pleasing mannered gentleman; a capital French scholar, frank and outspoken, with a good general knowledge of the world. Even in the midst of that gallant race, his coolness under fire was noticeable, and his capacity for organization was no less deserving of notice. If you, gentlemen, had seen the state of his army as I saw it early in June, when he commanded but ten battalions and a battery on the Zewin Dorz—if you had seen him, as I have seen him, drive back and hold in check for four months one of the greatest military Powers in Europe—if you had seen the material with which he achieved all this—empty treasure-chest (he has not had 200,000*l.* since the outbreak of the war, and commenced it with but 1,500*l.*), skeleton battalions, incompetent officers, useless cavalry, and untrustworthy Generals—you will agree with me that no Commander in this generation, at any rate, has shown more ability, more gallantry, or deserves more praise, than Ghazi Mookhtar Pasha.

His Chief of the Staff, Faizi Pasha, an Hungarian refugee, was a man of varied attainments, a good French and German scholar, capital topographical draughtsman, and, though upwards of 73, possessed of great powers of endurance. Prior to this campaign, he had done the Porte good and gallant service: the fortifications at Batoom were constructed from his plans, and he designed the new works in the neighbourhood of Kars and Erzeroom; he served through the siege of Kars in 1855, and was frequently mentioned in the dispatches of Sir Fenwick Williams.

The Commander of the Turkish right wing, in the Alashgird Plain, was one Lieutenant-General Mahomed Pasha; he, too, had served in the war of 1855, and was undeniably a gallant soldier. He was quite uneducated, scarcely able to read; despised the character of the Russian soldiers even more than the generality of Turkish officers; poor fellow, he was shot through the head in a vain attempt to rally his men, in the first action of the war, and so spared the humiliation of seeing his own men, one short half-hour later, flying headlong before the hated Giaour.

The Commandant of the left wing, and of the fortress of Ardahan,

was one Lieutenant-General Hassan Sabri Pasha. He owed his position entirely to Court influence, for last year he was removed from his command in Montenegro for incompetence; his conduct at Ardahan threw a doubt on his personal courage as well as on his ability.

Mookhtar himself took command at Kars, whilst Ismail Pasha, a Koord, the Viceroy of the Erzeroom vilayet, retained the military and civil leadership in that place. He certainly showed great lack of promptitude in arranging the forwarding of warlike material, and fully deserved the accusations freely poured upon him by his brother Generals.

The plan of the present campaign was evidently based on that of 1828. The road from Akhalzih to Ardahan passes over such bad ground, and is so impracticable for guns that the project of advancing a column by that route was abandoned, and the army for the conquest of Armenia massed at Alexandropol (Goomri) and Erivan. The idea was to move rapidly on Kars, siege or mask it with a sufficient force, then to push on to Ardahan, capture that, and advance on Erzeroom in three columns, from Ardahan, from Kars, and from Bayazid.

The road from Ardahan passing through Urul, Pennek, Olti, and the Giurji Boghaz Defile, is, until it emerges into the valley of the Euphrates at Hinask, essentially a mountain path, impracticable for field artillery, without the expenditure of much engineering labour.

That from Goomri to Kars is a good military highway, the Arpa Tchai being bridged near Alexandropol, the Kars river at Djamushly. From Kars there are four routes to Erzeroom, all practicable for guns, all diverging at or near Beghli Ahmed. The northernmost, styled the Hissar Boghaz, ascends the Soghanli Mountains near Tchapakli, crosses the Hoonkiar Dooz, thence by Bardez, Yeni-Kui, and Ala Klissa, joins the other three at Kuipri Kui. The second, called the Sakin Boghaz, branching off at Kotanli, passes through Deli Mussa, Yeni-kui, and so on to Kuipri Kui. The third, following the course of the Kars stream to Sara Kamysh, crosses the Mellidooz Plateau (the scene of Paskiewitch's triumph on 20th June, 1829), down into the bed of the Chan Su at Kara Orghan, ascends the Zewin Plateau, where Salegh Pasha was defeated on the preceding day, in 1829, by the Russian Marshal, through Alakilissa to the Aras at Kuipri Kui. Whilst the fourth, branching off from the last road at the Mellidooz Plateau, passes through Medzingird, and runs south to the bed of the Aras at Khorassan, whence it follows the course of that stream to its source in the Devi Boyun Ridge, crosses over that chain of hills, and drops into Erzeroom.

The road from Bayazid running through the Aliashgird Plain, crosses the Kose Dagh Mountains by one of three routes from Moola Suliman, and connects itself with the Kars roads at Kuipri Kui. At this place there is an ancient stone bridge, not of much strategic importance, however, as in June the Aras is fordable at many points below the bridge, and nearly anywhere above it. At the junction of all the roads leading from Russian territory to Erzeroom, Kuipri Kui has ever been looked upon as a spot that required defence. In 1855 Sir

Fenwick Williams established a depôt of provisions there, and threw up earthworks. It is difficult to conceive why steps were not taken early in this campaign to render this place thoroughly defensible. Its strategical importance is patent to the veriest novice in military matters; yet the Turkish authorities contented themselves with merely putting in order General Williams' old works, although, owing to the increased range in fire-arms, they were commanded on the eastern and northern faces by adjacent hills well within range of field artillery.

On the crest of the Devi Boyun strong working parties were employed in completing works left unfinished in 1855; but their labour was of the most superficial kind. There was no superintendence of workmen, whose sole aim and object seemed to be to give a minimum amount of cover with a maximum expenditure of time.

I am afraid I have dwelt at great length on the description and position of the hostile armies, and nature of the roads over which they will have to pass; but, as to the best of my knowledge these details have never been described before, whereas the actual campaign has been told in every daily paper, I have entered somewhat freely on these points.

To turn now to the actual operations. On the 24th of April, Mookhtar Pasha was in Kars with 38 battalions, and though well aware that war was inevitable, he was somewhat surprised at the sound of distant firing, and rather more so when he was informed that a strong force of Russian cavalry had crossed the frontier, and after a short skirmish captured three squadrons of his cavalry on outpost duty. He at once sent a *parlementaire* to Loris Melikoff, and was courteously informed that war had that day been declared between the Sultan and the Czar; that as the Turkish outposts had opened fire on his men, there was no alternative left to the Russian cavalry commander but their capture. This was followed up by the main column of the Russians crossing the Arpa Tchai, and on the 27th taking up their head-quarters near Mazra on the Kars River; at the same time Tergukassoff crossing the Ararat Mountains by the Caravan Serai road, marched straight on Bayazid, which was surrendered without a struggle, the garrison evacuating it on the approach of the enemy and falling back on Van, where Lieutenant-General Faik Pasha was endeavouring to organize a force of Koords to operate on the Russian line of communications.

Mookhtar Pasha knew well the real condition of Erzerroom, he knew that were he shut up in Kars there was no one competent to organize a relieving army; nothing, in fact, to oppose Melikoff's advance on the capital of Armenia, so he determined to retire from Kars, which he had personally ascertained to be well supplied with commissariat stores and war material, and to take up a position on the Soghanli Range, where he would form an army from the reinforcements now daily expected from Europe and from Syria, and would then take the offensive. Consequently, before the investment of Kars was complete, taking with him two field batteries, a mountain battery, nine battalions, and about 500 horse *zaptiehs*, or mounted policemen and Circassians, he, on the 5th of May, retired *viâ* the Hissar Boghaz to the Hoonkiar

Dooz Plateau. On this retreat he was followed up by the Russian cavalry, who, however, quailed before his Martini-Henry's, and, with the exception of picking up a few prisoners in the shape of stragglers, and a few tents, did no harm.

Melikoff did not attempt to attack him, but, placing a cavalry brigade at Tchapakli to watch his movements, made his preparations for the capture of Ardahan. For this purpose he left the greater part of his camp standing, with about 10,000 men to mask Kars, and moved himself with the 20th and 39th Divisions, *via* Zarchat and Boskiu, to Ardahan. Owing to the apathy, or, as it was freely whispered, the treachery of Sabri Pasha, a bridge was thrown over the Kur Su, and on the 15th a strong Russian brigade seized, unopposed, an eminence commanding the Emir Oglou, a redoubt about three miles west of the town, and generally considered the key of the place. The commandant of this outwork was one Captain Mehemet Bey, a Prussian, whose father had been in the Turkish service, and who from his youth had been in Turkish employ. Seeing the danger of allowing the enemy to occupy this eminence, he applied to Sabri Pasha for reinforcements in order that he might attack them. This was refused, and the following morning the enemy, who had busied themselves during the night in throwing up batteries, commenced the bombardment of the Emir Oglou, the guns of which were speedily silenced, and the place assaulted. That it defended itself gallantly may be judged from the fact that out of four companies of the Angora Redif battalion who held the work, but sixteen escaped. Having seized this work Melikoff moved his men round to the southern face of the city, and commenced to bombard the works there. During the night of the 16th, Sabri Pasha escaped, and on the following morning the city was assaulted. Those of the garrison endeavouring to escape by the north were met by a brigade of Cossacks posted there, and cut down, whilst a battery playing on the bridge increased the work of destruction. After the capture, the place was thoroughly looted by the Karapapak irregulars, who were allowed three days for that purpose. Any act of violence brought to the notice of the commander was severely punished. It has been said, and freely circulated in England through the Ottoman Embassy, as well as in the press, that the Russians wantonly fired on the hospital over which the Red Crescent was flying, and that numbers of patients, as well as attendants, were killed. Gentlemen, this is absolutely false. I was present with Sir Arnold Kemball on the Olti road, when strings of Ardahan fugitives were pouring into Erzeroom, and I never heard a word of this. On the contrary, one and all spoke of the manner in which they had been treated when captured, for all Redif soldiers were released, and given five days' rations to enable them to reach Erzeroom. I have here a letter from a German doctor in Turkish employ, who was taken prisoner, and he says a few shots hit the walls of the hospital during the engagement, but that no harm was done, and he speaks in the highest terms of the way in which the Russians made arrangements for the Turkish wounded. I had frequent opportunities of speaking to Captain Mehemet Pasha, and many officers and men

present at the assault, and they one and all denied the fact that any cruelties had been perpetrated; and I think it only just that I should here exonerate the Russians from false charges, as I shall later on exonerate Mookhtar Pasha from the same crimes. The Turkish losses at Ardahan were 1,930 killed, 411 wounded and about 3,000 prisoners. This number was given me by a doctor taken prisoner, but subsequently released. The wounded includes only those who were captured in the place and healed there. Many hundreds reached Ardanutsch and Erzeroom.

Leaving General Komaroff with a strong brigade in Ardahan, Melikoff returned to Kars, erected siege batteries to the north and north-east, and commenced a bombardment of the Mookhliss Karapaltak and Kara-Dagh Forts. Tergukassoff, in the meantime having captured Bayazid, pushed a reconnaissance towards Van, and advanced as far as Kara-Kilissa, the Turks falling back before him to Delibaba, where Mahomed Pasha now had 12 battalions, 2 field and 2 mountain batteries.

Komaroff too pushed a reconnaissance to Pennek. So faulty was the Turkish Intelligence Department, that it was fully believed a complete division was there, and Olti was evacuated precipitately, five battalions falling back on the Tehakir Baba, on which Mookhtar now retired—whilst three retired to the Giurji Boghaz. It was well for the Turks that the Cossacks did not pursue, for the retreat was conducted in the most extraordinary manner. The men straggled all along a narrow mountain path; it took me five hours to pass from the head to the rear of the column, which consisted of officers, men, guns, baggage animals and fugitive villagers in one vast confused jumble. No one questioned me, asked me what I wanted, where I was going, but made way for me to pass through their ranks as if it was perfectly natural I should wish to be going to Olti, which they had just abandoned. I spoke to one battalion commander who was seated in a field smoking a cigarette, and asked him what this retrograde movement meant. He told me that the Ardahan division had pushed on, occupied Olti, and was now crossing the Sevri Dag, but, "Inshallah, we shall reach the Giurji Boghaz before them and beat them there." On the 5th June, Mookhtar learnt the true strength of Komaroff's reconnoitring force, and immediately detached Hadji Raschid Pasha, with 8 battalions, 2 regiments of Bashi Bazooks, and 6 mountain guns, to drive them back. On his approach the Russians retired, they, however, seized the large depôts of provisions in Olti, besides about 3,000 stand of Enfield rifles, which the commandant in his agony to escape had omitted to destroy.

In the meantime Mookhtar Pasha, in order to be better able to support his right wing in case of attack, fell back on Zewin, and occupying the Khorum Doozi plateau, strongly entrenched it; he had now received reinforcements, and had 20 battalions, all told, in that position.

In order to cover this movement he sent forward his Circassians, numbering about 3,000, under one Lieutenant-General Moussa Pasha (a man who, under the name of Kondukoff, had for many years com-

manded a Russian cavalry regiment), to Beghli Ahmed. Here on the night of the 29th May, this force having, as it is customary in the East on such occasions, no outposts, was surprised by a Russian cavalry brigade, and after a short attempt to defend themselves, put to flight, losing 83 killed, 128 wounded, 300 prisoners, and 2 Galloper guns.

In conversing with Moussa Pasha afterwards, he told me that his men would not face the fire of the dismounted dragoons, though they were perfectly ready to attack them when mounted.

Mahomed Pasha now learnt that Tergukasoff's forces only consisted of 8 battalions, with 2 batteries and 7 regiments of horse, and so he determined to advance from Delibaba and drive him out of Zedikan, which had been in Russian possession for some days. Leaving a battalion and battery at Taikhojeh, to prevent the Russians cutting in between him and the Commander-in-Chief, he himself moved forward to Taghir, and offered battle; on the 15th, the Russians advanced and took up a ridge opposite us, and at daybreak on the 16th, attacked us in front with swarms of skirmishers, whilst with their guns, which they pushed up to within 1,500 yards, they pounded us out of the shelter trenches. Two battalions of infantry, with the whole of the cavalry now advancing up a ravine on the Turkish right, captured a hill enfilading our front, when a general *sauve qui peut* ensued. As I left the field, the Cossacks were busy with a crowd of fugitive infantry. I have been told by Turkish staff officers, not present at the engagement, that their loss was 21 killed and 125 wounded. I prefer the evidence of my own eyes, and of regimental Officers on the field, and I know for a fact that that night but three battalions were mustered at Delibaba. A Turkish army quickly disperses, but as quickly re-assembles, and the next morning staff officers were whipping up fugitives all over the country, who, finding they were not pursued, rejoined their corps in the front.

The losses, as far as I could ascertain, were 1,426 killed and missing (of whom 500, I see by Russian official returns, were captured) 965 wounded, and 11 guns abandoned. The Russian loss being about 300 killed and wounded. Mahomed Pasha, the commander, was shot through the forehead whilst endeavouring to rally his men, whilst Sir Arnold Kemball, besides being shelled out of the place he had selected for his breakfast, was chased about twenty-five miles by Cossacks.

Immediately on hearing of this reverse, Mookhtar dispatched numbers of mounted officers to scour the country for fugitives, he telegraphed to Erzeroom for every available man to be sent to Delibaba, and placing himself at the head of 5 battalions, 1 battery, and 1,000 horse, moved across himself to take command of the right wing; by this means, on the 21st, he was enabled to attack Tergukasoff with 21 battalions and 12 guns, who had entrenched himself on the heights of Eshék Khaliass. No attempts were made to turn the Russian position, which was most extended, the Turks contented themselves with a frontal attack on a strong mountainous position covered with shelter trenches, and though their opponents numbered but 8 battalions and 8 guns, with a rocket troop, they were unable to



effect anything. The gallantry of the Turks, inspired with enthusiasm by the personal bearing of Mookhtar Pasha, was of no avail; again and again did they assault the Russian lines, only to be shot down in hundreds by the withering fire of the breechloaders above. Night put an end to the scene of slaughter, and taking cover of the darkness, Tergukasoff, who saw he was outnumbered, fell back on Zedikan. The Turkish losses, acknowledged to be 368 killed and 1,080 wounded, were too heavy to admit of pursuit, and their transport material, much reduced by the disaster of the 16th, needed reorganization. This battle, though without actual results, and reflecting as much credit on the Russians as on the Turks, served the purpose for which Mookhtar intended it, it showed his men they had a leader in whom they could trust, and that they were a match, man for man, for the Russians.

I must now turn to Faizi Pasha, who had been left in command at Zewin. On the 21st he learnt that Melikoff, at the head of a division, was advancing from Kars, and on the 24th it appeared he was on the Mellidooz Plateau. Mookhtar having taken away 5 battalions and a battery, the gallant old Hungarian had but 15 battalions, 6 field and 6 mountain guns with him; he, however, had an admirably entrenched position, and his men, having heard of the success at Khallans, which, of course, had been magnified into a Turkish victory, were full of fight. As long as he could hold his left, Kohlmann knew 50,000 men might beat their heads against his right and front. At daybreak on the 26th, under cover of a heavy fire from a battery of 9 Pfünder guns established on the left bank of the Chan Su, the Russians in close columns moved to the assault.

There was no excuse for their not knowing the ground, for, as I said before, Paskiewitch, on the 19th June, 1829, completely defeated Salegh Pasha here; yet Melikoff, without even reconnoitring, led his men into broken ravines, which terminated in precipitous cliffs, the crests of which were lined with Turkish riflemen. These had nothing to do but to lean over and fire into the crowds below, who vainly endeavoured to find a way out of the trap they had been led into. All day long from dawn to sunset did this fight last; one weak attempt was made to turn the Turkish left, to which a broad open ravine led, but it was checked by a gallant bayonet charge by the Aleppo Redif battalion, who lost 150 in the struggle. The Russians showed much gallantry—the heroism of their officers being most marked—but it was an unequal strife, they were only led up the ravines to be driven back by the pitiless hail of bullets poured from above. Broken and dispirited they withdrew as the sun went down, and the following morning, Melikoff finding his losses so enormous, retired on Kars. The loss of the Turks was 138 killed, 328 wounded; that of the Russians we do not know; Faizi Pasha told me he thought it could not be less than 2,500; an Austrian military correspondent judged it 5,000; the Russian official statement was 856, whilst in officer's letters, captured in a mail bag shortly after the battle, it was never estimated at more than 1,000; in these the blame of the undertaking was thrown on General Heimann, who planned and led the assault, which, at any rate, showed he believed in his own plans.



Mookhtar Pasha, hearing of the success of his lieutenant, moved across to his own head-quarters, recalled the troops from Olti, and ordered a general advance. With recent reinforcements his own army and his right wing now numbered 23 battalions each, and with these he judged, and judged rightly, that he would be able to relieve Kars and drive Tergukasoff across the border. On the 30th June, we advanced from Zewin, and on the 7th occupied Vairan Kale, the present head-quarters of the Grand Duke; here we were reinforced by 8 battalions and a battery, under the command of Mushir Mustafa Pasha, the newly appointed commandant of the fortress, and we opened up communications with the place, men passing freely in and out. On the 10th, the Russians, fairly demoralised by the defeat at Zewin, and the prompt advance of Mookhtar Pasha, raised the siege and fell back on an intrenched camp at Kurrukdurra, midway to Goomri.

Kars has been so constantly described within the last few days that I shall only weary you by entering into a detailed account of the place. I am afraid I was heretical enough in July to predict that it could only be taken by a *coup de main*, or else starved into submission, from the position of the works, the majority of which have low parapets, no ditches, and not flanking defence, but are situated on the crest of the hills; shots either pass clean over or bury themselves in the hill-side below. It was calculated that the Russians fired 32,000 shells into the place in the bombardment in June and July, yet the casualties were but 85 killed, and 155 wounded, in the batteries and town; whereas, including losses in sorties, the total list ran up to 368 killed and 1,362 wounded. In the case of assault, troops cannot be moved rapidly from one part to another, for the banks of the Kars Tchai are exceedingly precipitous. There is only one road connecting the western with the eastern hills, and the garrison, too, was so small that it was impossible for them—a bare 10,000 men—to man seven miles of entrenchments, besides the numerous forts. This entrenchment, too, was of weak profile, as indeed were most of the works on the hills: the ditch was no obstacle, and the *trous-de-loup* and other obstacles in its front were not worthy of the name.

The enemy having fallen back, Mookhtar busied himself in getting up supplies of food and war material for the fortress, which really had suffered no want during the so-called siege, and moved on himself first to near Vezinkui, afterwards to the northern slopes of the Aladja Dag above Kharkana. To keep up his communications with that fortress he withdrew 18 battalions from it, 12 of which, under Hussain Hami Pasha, he posted at Vezinkui, 6 on the Olya Tepe, whilst a couple of battalions were posted on the Nakharjee Tepe to our right. These Tepes are sugar-loafed hills, rising up from the plateau to a height of some 600 to 800 feet; their sides are steep and smooth, and they formed very strong adjuncts to our position.

Tergukasoff in the meantime hearing of Melikoff's reverse, evacuated Zedikan, and fell back through Kara Kilissa and Diadin to the Balikly Lake, and so to Igdyr. He was not molested in this march,

although Ismail Pasha possessed 25 battalions and 18 guns, and the Russian general had but a third of that force.

Whilst this was going on with the main columns, Faik Pasha, advancing from Van, encountered the Bayazid garrison at Teperis-kui on the 19th June. His forces amounted to 6 battalions, 2 field and 1 mountain battery, and 8,000 Koords, whilst the enemy numbered but 2 battalions and a regiment of Cossacks; the Russians defeated, fell back on the citadel, the Koords pursuing them closely. As they were without guns their position was hopeless, for Faik cut off the water supply, and commenced to bombard the place; the commander then hung out a white flag, and sent an officer to treat for surrender. The details were arranged, and the following afternoon Faik Pasha sent a company down to the gates of the citadel. They were thrown open, and the Russian garrison, unarmed, commenced to march out, when suddenly a body of Koords rushed in on the Russians, sword in hand, cut in between them and the gateway, and unopposed by the Nizam troops, who looked on passive spectators, killed 280 of their unarmed enemy in cold blood. The Russian commander at once shut the doors of the place; then ensued one of those scenes of horror which it does not do to dwell on. Suffice to say, the last for blood being whetted, the Koords pillaged the town, killing every Christian man, woman, and child, whom they came across; it is computed that 1,400 were thus slain. Faik now prosecuted the siege with something like the usual indolence of the Turk, taking advantage of the lack of mobility in the Ottoman armies. Tergukassoff, by a forced march from Igdyr cut in between Ismail Pasha and Faik, severely defeated the latter, capturing 4 guns and 400 men, relieved Bayazid, and carried off the garrison with him. Ismail now pushed on to Zor in Georgia, and subsequently to the hills overlooking Igdyr, but he never attempted to carry out his loudly proclaimed intention of advancing on Erivan, although Tergukassoff with but 14 battalions now barred the way.

To turn now to Mookhtar's army. The month of July was passed in desultory skirmishing with Loris Melikoff's forces, and it was not until the 18th of August that anything of importance occurred, when the Russians heavily attacked the Turkish position. They were signally defeated; but, owing to the disinclination of the Ottoman cavalry to face infantry fire, drew off to their camps at Kadakler and Karajal in good order. On the night of the 24th of that month Mookhtar, hearing that the majority of the enemy had moved from Kezil Tepe to Karajal, attacked that hill in force; it was carried by a brigade under Captain Mehemet Pasha, at dawn, and before the Russians could make any attempts to recapture it, batteries were thrown up on the crest, and the place covered with shelter trenches. A heavy fight ensued, the Russians endeavouring to recapture the hill, the Turks pushing forward in hopes of carrying the Karajal camp; indeed, at one period of the day it seemed as if the Russians would have been driven across the Arpa Tchai. General Heimann, however, checked the retreat, which was assuming an ugly look, and saved the day from proving a disaster. The Turks, however, remained in possession of the Kezil Tepe Hill, which they armed with siege guns, and Mookhtar moved his head-

quarters down into the plain. The Russian official loss was 12 officers and 237 men killed; 34 officers, including 3 generals, and 667 men, wounded; the Turkish loss was officially stated to be 300 killed and 940 wounded.

The month of September was passed pretty quietly. Slight cavalry skirmishes between the hostile forces near Subatan and Igdyr relieved the monotony of the life; it, however, began to be whispered that strong reinforcements were daily arriving at Goomri, whilst a brigade had also arrived from Ardahan, which had been reinforced from Akhalzik. Mookhtar, too, had been reinforced, but fearing for his communications with his right wing, he established a camp of 5 battalions, and a battery at Natschevan, midway between the Aladja Dagh and Koolpi. This brigade, on the 30th September, was attacked by a Russian corps of 8 battalions, which was driven back, our loss being 250 killed and wounded.

On the 2nd October, commenced the series of offensive movements on the part of the Russians, culminating in the complete conquest of Armenia. At dawn, a strong Russian column was seen advancing from Karajal to the Little Yagni Hill, held by Captain Mehemet Pasha, whilst other columns attacked the whole Turkish line, the Great Yagni, the defence of which was entrusted to a single redif battalion, was carried, 3 officers and 37 men of that gallant volunteer corps only surviving. This was the only ground the Turks lost; their position was defended with the most obstinate courage, and although they were outnumbered more than two to one still they held their own; their loss was about 1,000 killed and 3,200 wounded, whilst the Russian loss was computed at 7,000 men! At nightfall, holding the Great Yagni with a very strong force, Melikoff withdrew to Karajal and the Kapack Tepe, which he strongly intrenched. On the following day, owing to the difficulty of supplying the garrison with water, the Great Yagni was abandoned by the enemy, and Mookhtar immediately re-occupied it. On the 5th October, Melikoff further drew in his forces, concentrating them all at Karajal and Kapack Tepe preparatory to a further offensive move. On the 8th, seeing the enemy was receiving continual reinforcements, Mookhtar evacuated the Kezil Tepe and retired to his old position on the slopes of the Aladja Dagh, with strong posts on the Nakharjee, Oliya, and Little Yagni Tepes, his main force being above Kharkana and a division at Vezinkui. His front was defended by an almost continuous line of shelter trenches. On the 9th October, the Grand Duke, who now had assumed command of the Russian camp, occupied the Kezil Tepe, Sabalan, Hadji Veli, and the Great Yagni, and at noon commenced to shell the Turkish position. This was vigorously responded to, and at dusk it ceased. At dawn on the 10th the same operation was performed, the Turks suffering some loss from the fire. On the 13th October, strong columns of the Russians threatened all points, and their batteries kept up a continuous fire. The whole attention of the Turks was fixed on the front. No one thought a turning movement feasible; indeed, Mookhtar Pasha assured me that the ground in the south of the Aladja Dagh was quite impracticable for guns. On the 14th, however, Mookhtar learnt to his

cost it was not so. Circassians brought in word that a strong Russian division was at Orlok advancing on his rear; at the same time the Grand Duke advanced in several columns on his front. Hadji Raschid Pasha with twelve battalions, two field and one mountain battery, and 2,000 cavalry, was sent to oppose the division advancing from Orlok, and for some time it appeared as if the Turks would prove successful. Lazaroff's men were driven back by the impetuosity of the Turkish attack, but rallied on a ridge between Bazadich and Orlok; but in the meantime the Oliya Tepe had been carried, and a strong column ascending the Nalband Tepe completely cut off the Turkish right wing from Kars. This was at 1 p.m. on the 15th, and as soon as the Moslem saw the Moscov on the Nalband Hill, a panic seems to have seized them, and they fled headlong through Vezinkui towards Kars. All attempts to carry the Little Yagni were frustrated owing to the gallant stand by Captain Mehemet Bey, the commander; but at night, seeing the *debandade* of the main army, he retired into Kars abandoning his guns. Mookhtar himself reached the place early on the following morning, and at once set to work to mobilise a corps for its defence. The remnants of 30 battalions—all he could muster out of the 64—he showed that morning was all he could spare Hussian Hami Pasha for the defence. Thirty-four battalions were captured by the Russians, 42 guns, and 7 Pashas were also taken.

On the 17th Mookhtar, telegraphing to Ismail Pasha to fall back on Kuipri Kui, retired himself with ten weak battalions and a few mountain guns *viâ* the Hissar Boghaz Pass to Bardez, and so on *viâ* Yenikui to the Aras, where on the 28th he effected a junction with his right wing, numbering not more than 10,000 men all told. Without delaying an instant they fell back on Hussan Kale, and, regardless of the fact that Heimann was in pursuit from Kars, Tergukassoff from Bayazid, bivouacked in the open without a picket. Heimann pushed on, and learning from his cavalry the actual state of affairs, moved a brigade under a General Shack, round *viâ* Ogomi to the rear of the Turkish position, whilst he attacked it in front; thus surprised, and at night, the Osmanli fled precipitately, leaving 500 prisoners in the hands of the enemy; a brigade at Khooroodjook, alarmed by the firing, turned out and checked the Russian pursuit, which, on account of the fatigue of the men after their long, forced marches, was not pressed vigorously. Thus, on the 29th, the Turkish forces were enabled to take up a position on the Devi Boyun, which had recently been considerably strengthened under the able superintendence of Faizi Pasha, who in July, owing to Oriental jealousy of Europeans, had been relieved of his appointment as Chief of the Staff. The force now at Mookhtar's disposal amounted to his own 10 battalions, numbering 3,000 men, Ismail's 22 battalions, about 10,000 men, 3,000 of the garrison of Erzeroom, and about 60 guns, of which 36 were horsed. On the 4th November, Heimann, who with Tergukassoff's forces now commanded 48 battalions, 7 regiments of cavalry, and 96 guns, determined to attack the Devi Boyun, sending a division during the night to the ravines, near Partak on the north and Nab-i-kui on the south. He advanced in heavy masses to attack Mookhtar's front,

This movement was covered by a strong body of dragoons, which tempted the Turks out of their entrenchments. Up to this time, the Ottoman troops had gradually repelled all attacks on their left flank, commanded by Captain Mehemet Pasha; but now, led into an ambuscade, they were mercilessly shot down, and ere they could reach the shelter of the entrenchments on the crest of the *Devi Boyun*, the Russian infantry had seized them. A wild *debandade* into Erzeroom ensued; guns were hastily abandoned, and fully 2,500 prisoners remained in the hands of the enemy; our losses were 56 guns and about 3,000 killed and wounded. Heimann at once seized this position, and straightway commenced to throw up batteries for the bombardment of Erzeroom. A *parlementaire* was sent in to summon the place to surrender; but, by order of the Sultan, an answer was returned, that the place would be defended to the last man and the last cartridge. On the 9th, the Russian General, who throughout the campaign seems to have acted in a blindly gallant manner, scorning reconnaissances and despising losses, made an ill-judged attempt to carry the place by assault; the attacking columns lost their way, one only reached its destination and captured the *Medjidieh* redoubt, to the south-west of the place: they were speedily driven out by Captain Mehmet Pasha, who was always foremost where fighting was to be found, not before they had captured the garrison of 20 officers and 500 men. It is worthy of remark, that the Mahomedan inhabitants of Erzeroom, stirred up to enthusiasm by the Mooltahs, rushed up to the citadel for arms, and offered very substantial aid to Mehemet Pasha. The Russians left 300 dead bodies in the fort. What their other losses were it is impossible to say, but as the Turkish casualties amounted to 700 killed and 1,500 wounded, the enemy must have lost very heavily.

And, now, to turn to Kars. The Grand Duke, after the battle of the *Aladja Dag*, still retained his head-quarters at *Karajal*, but directed *Lazaroff* to move on *Magardjik*, and thus cut off communication with Erzeroom. On the 10th, having dispatched all his prisoners, &c., to *Alexandropol*, he moved his head-quarters to *Vairan Kale*, and left a division at *Vezin-kui*. As he was prosecuting this march, the garrison made a sortie which was quickly repulsed, the Turks pursued into their intrenchments, and the *Hafiz Pasha Fort*, at the south-east corner of the fortress, was actually for some time in the hands of the Russians, who, before the garrison rallied, had time to dismount and carry off the breech-pieces of the guns mounted in it. The Russians now were compelled to fall back, with heavy loss. The Grand Duke, prior to commencing a bombardment, sent in a *parlementaire* to demand the surrender of the place. This was spurned; and, on the 15th, his batteries opened fire on the southern and south-eastern faces. *Hafiz Pasha Tcha* was abandoned by the Turks, owing to its guns being useless; and, on the night of the 18th, assaulting columns moved on all the forts in the plain simultaneously. After a hard struggle, the *Kanli* and *Suwarri Tabrai* were captured, and then a body of men, climbing the *Karadagh Hill*, took the fort on the crest in rear. The redoubt in its front, and *Karapaltak* to the north, now being commanded, easily fell, and the works on the west

side surrendered. The Russians captured 3,000 guns, and about 16,000 prisoners, of whom one-third were sick and wounded in the hospitals. The Turkish loss in the defence of the city was about 2,500, whilst the Russians lost about 3,000 killed and wounded.

Kars having fallen, the Grand Duke was enabled to detach Melikoff with two complete divisions to aid in the capture of Erzeroom, although the place is surrounded by a bastioned base of considerable strength. It is so situated that the fall of the Azizi, or Kermedli Forts, necessitates the fall of the city they completely command, being built on eminences quite overlooking the place. Although Mookhtar Pasha has been reinforced by 17 battalions from Trebizond, there is too much reason to fear his troops are demoralized by recent defeats to make a very determined resistance, and there is grave reason to doubt that the place is adequately provisioned. I think we may make up our minds to hear, in the course of the next few days, that Erzeroom has fallen. The fact that Loris Melikoff needs a winter quarter for his troops will induce him to risk an assault, which, in my opinion, will prove a much more hazardous undertaking than that of Kars: but when we think of the numbers of men at his command, of the few available for the defence of the city, the fate of the place seems sealed. With its fall we may consider the campaign in Armenia at an end.

I have not dwelt on the operations near Soukhoun Kali and at Batoom, for the simple reason that I was not in a position to know as much about them as you in England were. Suffice it to say, that at the outbreak of war, emissaries were sent into the Abkhasia country to foment insurrection, and that when the tribes had risen and massacred the Russian garrison of Soukhoun Kali, a force of 10 battalions and 30 guns were dispatched from Constantinople to aid the insurgents. The plan, of course, was to strike at the Russian line of communications and divert troops from the main operations in Armenia; but as in 1828, in 1855, so in 1877, this movement failed. The country is extremely difficult for military operations, and the Turkish organization is eminently unsuitable for offensive warfare. Finding the expedition a failure, the Porte withdrew the troops in August, dispatching them to the European theatre of war.

With regard to Batoom, under the gallant Dervish Pasha, it made a most determined stand against all Oklobjio's assaults, and finally, in July, that General had to withdraw; now, however, having been strongly reinforced, he is once more resuming the offensive. From all I can hear, the place is simply impregnable, and though it probably will be ceded to Russia, I do not think it likely that it ever will be captured.

And now, gentlemen, if you will permit me, I will dwell for a few minutes on what, in my humble opinion, were the causes of Russian failure in the first part of the campaign, and of Turkish reverses during the latter end.

To a certain extent, campaigns in the same theatre of war must necessarily be repetitions of each other, the same roads must be followed, fortresses seized; but here Loris Melikoff took up Paskie-



witch's plan, followed it slavishly, even in its errors, halting only when dash and promptitude became necessary. In 1828, Paskiewitch's left wing was far too weak; its commander, Prince Tchavtzavadzi, whose grandson I may mention was badly wounded at the battle of Kczil Tepe in August last, after reaching Toprak-Kali, was threatened by hordes of Koords, under the Pasha of Moosh, and though successful in an engagement with them, felt constrained to retire; this year Tergukasoff was in precisely the same predicament. Then, on the other hand, Melikoff, instead of boldly assaulting Kars after the capture of Ardahan, when his own men were flushed with triumph and the Turks dispirited by defeat, leisurely commenced siege operations on a face by which Kars is perfectly unassailable. Again, at Zewin, instead of attacking on the left flank as Paskiewitch did, where the ground is open and admits of the free movement of troops, he endeavoured to carry a strong entrenched position by a frontal attack up ravines where his men soon became one confused crowd.

In fact, he failed to appreciate the military qualities of his opponents, and did not recognise the increased advantages the breech-loader and spade give to the defence; for, indeed, one untrained man, provided his heart is in the right place, behind a shelter trench, is, in these days, worth two highly trained men attacking him.

To turn now to the Turks. I think you will all agree with me that, when Mookhtar Pasha found he had but 28 battalions with which to watch the three roads on Erzeroom, that he could not have employed them to better advantage than in posting men at Olti, Zewin, and Delibaba. Owing to the innate heroism of the Osmanli, he was enabled to repel the two columns of Melikoff and Tergukasoff, and to force them back on their own frontier. Here he failed. Possessed of the same feeling as the Russian Commander, profound contempt for his foes, Mookhtar having relieved Kars, pushed on too far, and exposed himself to being cut off from that fortress. That that danger was pointed out to him I am aware, for I had more than one conversation, both with him and with the Chief of his Staff, on this very point. But he ridiculed the idea of the Russians being able to resume the offensive until it was too late to act. Another great cause of Turkish failure was the want of cavalry, the absence of outposts, and omission to use reconnoitring parties. The consequence was the Commander-in-Chief never had any reliable information concerning the enemy's movements. It may seem astounding; but to illustrate this I will tell you that, on the 30th of July, a Russian division moved down from Tashkale to Ani, and quietly encamped there within sight of our camp, and yet the fact was not discovered until more than half their tents were pitched at noon. In the same way, on the 5th August, this force moved off unnoticed.

On the 10th July, Melikoff raised the siege of Kars, struck his camp, and retired to Kurrukdurra. This, too, was not known or reported until 9 A.M., by which time he had reached his new position in safety, with his long commissariat and siege trains.

Regarding those minor matters on which, after all, the efficiency of an army depends, sanitary arrangements were systematically neglected.



Water pickets were unknown. Men bathed, washed their clothes, and watered their horses in the same stream from which the water-carriers fetched the men's water. The Turks believe firmly in cold water for sore backs, and as 90 per cent. of the horses suffered from bad saddles, it was the usual thing to see strings of horses standing in the stream, their owners busy washing the sores. It was not to be wondered at that dysentery was rife. Then, again, no attempts were made to bury the offal of beasts killed; it was merely piled in large heaps and allowed to fester in the sun. With reference to discipline, in our acceptance of the word, there was none, though crime was rare; men fell out of the ranks as they pleased, and, despite the undeniable bravery of the Osmanli, a wounded man always found a couple, or if need be more, comrades, to help him to the rear. I speak under correction, but guards were unknown. I never saw any. Sentries there were in plenty, more especially in the day time. They relieved each other from their company tents. I have counted thirty-eight sentries round a regimental camp, and that 100 miles from the enemy. On taking up a new encampment, I have seen them literally at every twenty yards the whole way round. They never move from the spot on which they are posted, unless it rains, when they make for the nearest shelter. In the early part of the campaign, the commissariat arrangements were execrable; later on they improved; but the Turkish soldier never received his full rations, which, by the way are, on paper, immeasurably superior to those of any army in the world. The officers were, as a rule, simply worse than useless. From Generals of Division down to subalterns, they were ignorant, illiterate men. What astounded me most was the manner in which they abused each other before their juniors; there was a thorough want of *entente cordiale* between the superior officers, and this doubtless had much to do with Turkish failures.

And now a word or two about the so-called atrocities. Mutilation and stripping of the dead, and desecration of the graves of the enemy were the most I saw with the Army. In Mookhtar's army this was put down with a firm hand, and his severity cost him many men. On one occasion, I remember his hanging a Circassian for killing a Mahomedan villager, and straightway 1,100 of these gentry deserted. When we remember that until 1826, the Turkish soldier received a reward for every head carried to the Commander-in-Chief's tent, we may imagine how difficult it is now for a General to prevent killing the wounded. This in Asia, as well as in Europe, was practised, but without the authority and against the repeatedly expressed orders of the Commander-in-Chief.

One word more, and I have done; we have heard a great deal of the indomitable gallantry of the Turk, and more than once I have seen it written that he is the finest soldier in the world. No one concedes more to the valour of the Osmanli than I do, but like all other men he is liable to panic, and in this campaign we have had three very bad examples of panic occurring as soon as his flank is turned, viz., at Taghir, at the Aladjä Dagh, and at the Devi Boyun. I think the trait of gallantry in the character of the Turk has been a

little exaggerated. The Mahomedan religion is essentially a fighting religion, and as a rule all followers of the Prophet fight well. When we think of Jelalabad, of Delhi, and of Lucknow, we may safely congratulate ourselves, that we too have Mahomedan soldiery who have shown as much gallantry fighting under our flag as ever the Osmanli has done under his Crescent, and remembering that, gentlemen, I think the Russian bugbear may safely be laid aside once and for ever.

The CHAIRMAN: Gentlemen, if time had allowed, I dare say some of us would have liked either to have made some observations on this campaign or, at all events, to have put some question to the lecturer. One knows, however, how very difficult it is to condense all the detailed operations of a campaign into a single lecture, and perhaps, at this late hour, it would be hardly well for us to attempt to discuss it. The lecturer has abstained from making any predictions as to the future, which is not very often the case with lectures delivered in this Institution; nor has he had an opportunity of speaking of the extreme severity of the climate. I was looking back into my journal a day or two ago, and I found that, even on the 7th of November, it was with the greatest difficulty I could cross from Kars to Erzeroom; the snow was so deep that the principal passes were even then closed. I fancy, from what Mr. Norman has said, that the roads in that district must be very much improved since that time, because he spoke of three or four roads being practicable for artillery, and that certainly was not the case when I was there. This probably may have been done in 1855. Then, as to the fortress of Goomri, or Alexandropol, as it is called now; at one time that fortress created very great alarm; it was considered to be a sort of second Sebastopol. I was ordered by our Government to visit it and report upon it, and, thanks to my finding the sentries asleep, I got in. I arrived there about five o'clock in the morning, and, thinking that permission to go over the fortress would probably be refused me, if I applied for it, I rode straight up to the fort. I found it a very strong position, three sides being naturally protected, and one very strongly fortified. I went through the whole fortress, counted all the guns, and went home. Afterwards I called upon the Governor, and asked him for permission to visit it, but he told me he was very sorry, but he was strictly forbidden to allow anybody to see the fortress. With regard to the terrible massacre of the garrison of Bayazid, it was certainly a very rash move on the part of the Russians to detach so small a force so very far in advance, unsupported as it was. I think Mr. Norman has been very fair in his description of the two armies, though there are one or two small matters I should have liked to have remarked upon. For instance, the fact of Turkish officers not being able to read or write is not a very great sign of ignorance, for reading and writing are not so common in the East as with us. It is also very clear that the Turkish soldier does require, not only less drilling than most soldiers, but also less command; as long as there are two or three energetic men in command, he is very independent of his company officers. I am sure you will allow me to tender your best thanks to Mr. Norman for his very interesting lecture.



OUR EGYPTIAN OBELISK: CLEOPATRA'S NEEDLE.

Engraved from a Photograph.

## SPECIAL LECTURE.

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Friday, November 16, 1877.

ADMIRAL SIR ERASMUS OMMANNEY, C.B., F.R.S., in the Chair.

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### ON THE ARRANGEMENTS MADE FOR THE REMOVAL AND FOR THE TRANSPORT TO ENGLAND OF CLEOPATRA'S NEEDLE.

By JOHN DIXON, Esq., C.E.

THE CHAIRMAN: Ladies and Gentlemen, I have to mention to you that the Council had selected General Sir James Alexander for the honour of filling the chair to-day. I regret, however, to say that the gallant General is confined to his house in Scotland by illness. Perhaps you are not all aware that it is to Sir James Alexander that the merit is due of taking the initiative in active measures with regard to transferring the Cleopatra needle to England. As the General is unable to be present, he has transmitted a brief statement with regard to the steps that have been taken, which, with your permission, I will read:—

“ Having been asked to take the chair at the meeting of the Royal United Service Institution, on the 16th of November, I regret much my inability to do so owing to an unexpected attack of illness. I was particularly anxious to hear a very interesting and instructive lecture by Mr. John Dixon, C.E., on the construction of the iron vessel, in which he placed the Obelisk of Alexandria for transport to England, because I have been connected with this movement and in the manner which I beg now to explain as briefly as possible.

“ In the year 1867 I was present at the great Exhibition in Paris, and whilst admiring the Obelisk of Luxor at the Place de la Concorde, I was told that the British nation had as good an obelisk lying neglected in the sand at Alexandria, and which had been presented to Britain in 1820 by Mahomed Ali Pasha in recognition of the valuable services rendered to Egypt in the beginning of the century, under the leadership of the heroes Nelson and Abercromby, but that as the gift did not seem to be appreciated, the foreigner on whose ground it lay proposed to break it up for building materials!

“ This naturally led me, at once, to resolve to endeavour to save us from this national disgrace, respecting as I did the memory of the above illustrious men, and proud of the achievements of our fleet and army in the East. I collected as much information as possible regarding the prostrate Obelisk of Alexandria. It seems the French intended removing both the upright and the prostrate obelisk, “ Cleopatra's Needles,” for the former was found, after the Battle of Alexandria, with a cable round it, and the latter had been excavated all round, and its hieroglyphics copied, as may be seen in the great work by Champollion the younger, in the British Museum.

"I next endeavoured to direct public attention to the prostrate obelisk by reading papers before the Royal Society of Edinburgh, the British Association, &c., and I published a plan in *The Engineer* for transporting it to England. Engineers of eminence took up the matter, among others Mr. Dixon, Mr. Bateman, Mr. Lorimer Clarke, &c. Introduced to the then Chancellor of the Exchequer, the Right Honourable Mr. Lowe, I laid before him plans and estimates, aided in this by Mr. Gamgee, Mr. Hill, and Mr. Essie of London; but the time did not seem favourable for engaging in the enterprise, and it was hinted that possibly the obelisk was mutilated, and was now under the sea-wall, and that the Khedive might not allow it to be moved: I therefore determined to go to Egypt and ascertain the actual condition of the obelisk, and if found entire, endeavour to get his Highness's consent for its removal.

"The Earl of Derby, the Foreign Secretary, was so obliging as to give me an introduction to the Consul-General in Egypt, Her Majesty's Agent, General Stanton, C.B. He presented me to the Khedive at a special audience. I explained what was desired, and showed plans for the removal of the obelisk. His Highness then granted full powers for its removal, and his Chief of Harbours and Lighthouses, Admiral McKillop Pasha, said that every aid would be afforded at the dockyard of Alexandria.

"At Alexandria I became acquainted with Mr. Wayman Dixon, the brother of Mr. John Dixon, and on my expressing a desire to have the obelisk uncovered and examined (it was invisible under three feet of sand, and no building was over it) Mr. Dixon had it quickly uncovered, and it was found in good condition, and better than its twin the upright obelisk. Mr. Wayman then gave me the 'Dixon' plan for encasing the monolith in iron and having it towed to England.

"I then returned home, and at some expenditure of time and money, went on with the agitation for the removal of the national trophy to England. I had introductions in high quarters, and tried to obtain Government funds to ship and transport the obelisk from its inglorious bed by the sea shore, where it was treated with no respect. I had much intercourse with Mr. John Dixon, who was most zealous and anxious to engage in the work. I was about to endeavour to obtain aid in the city, when after a conference with Professor Erasmus Wilson, F.R.S., and giving full explanations to him of the state of the case, he nobly and patriotically said, 'there was no occasion to apply to the Government, nor to go into the city for subscriptions, he would undertake the whole himself and wanted no partners.' I gave him Mr. Dixon's plan of the iron caisson and others—an ingenious one by the Messrs. King, engineers, London, was to place the monolith in a hopper barge, such as is used for dredging, and, with a steam-engine in the stern of the barge, convey the obelisk to the Thames.

"Professor Wilson communicated with Mr. Dixon, made arrangements with him for shipping the obelisk at Alexandria, bringing it to the Thames, and placing it on a suitable site (I had got one in 1872 from the Metropolitan Board of Works on the Thames Embankment) and though a great misfortune befel the 'Cleopatra' in the Bay of Biscay, where it was cast off from the towing ship 'Olga' in a hurricane, and accompanied with a melancholy loss of life, we believe that Mr. Dixon with his energy and ability will overcome present difficulties at Ferrol, where the obelisk lies, and we shall yet see the venerable trophy ornamenting the Metropolis.<sup>1</sup>

"It only remains to notice that in 1801 Lord Cavan, commanding a regiment of guards in Egypt, made every effort to ship the prostrate obelisk. My grand uncle, Major Bryce, then a senior Officer of Engineers (afterwards Sir Alexander Bryce, Inspector-General of Fortifications), constructed a jetty to roll the obelisk towards deep water, but the sea carried the jetty away, and the army moving off, the attempt to secure the obelisk was then unavoidably though reluctantly abandoned."

<sup>1</sup> Its historical and archæological interest is very ably shown in Professor Wilson's popular pamphlet, published by Messrs. Brain and Co., and entitled "Our Egyptian 'Obelisk, Cleopatra's Needle,'" and also in his larger work, just published by the same firm. The Institution is indebted to Professor Wilson for the engraving of the obelisk at the head of this article.—Ed.

If Thothmes III was satisfied with the skill of his engineers in the transport of this obelisk down the Nile from As-suan, how greatly astonished must the Pharoah of the present day have been to observe the skill and ingenuity of Mr. Dixon, who enveloped this obelisk with an iron casing, which served to float it from the beach of Alexandria and carry it into the Atlantic. I consider the "Cleopatra" was ably designed for the object. We must all sympathise with Mr. Dixon in the accident which occurred to the vessel off Cape Ortegal, which, in my opinion, may be attributed to the shifting of the ballast; that she did not founder in the storm after she was abandoned by the "Olga" is due to the foresight of Mr. Dixon, by his mode of tubular construction. We must now wish him the fullest measure of success on its final voyage to the Thames.

The erection of this interesting record of antiquity in our metropolis occurs at a period to which posterity will refer as remarkable in our connection with Egypt and Africa. If this obelisk is to be regarded as a trophy to the victors under Nelson and Abercromby, it comes to our shores just when British enterprise, through the intrepidity of our heroic travellers, has completed the discovery of the mighty Lake system in Equatorial Africa; the sources of the mysterious Nile of the ancient Egyptians have been revealed; the mighty Congo has been traced; and the heart of Africa is being opened up to the blessings of civilization. Our influence with the Pharoah of the present day is predominant. We have a deep interest in the internal condition and further development of the fertility of Egypt. His Highness the Khedive now seeks for British councillors. Following on the achievements of Sir Samuel Baker, he has selected Colonel Gordon to rule over the Soudan, and to bring his recently-acquired territories (which extend to the Equator) under subjection; and, above all, he has plenary powers to exterminate the odious slave trade. I now beg leave to introduce to you Mr. John Dixon.

MR. DIXON: Sir Erasmus Ommanney, Ladies and Gentlemen: The Council of the Royal United Service Institution being good enough to ask me to address you on a subject of which I may be presumed to have some slight knowledge, I accede with pleasure to that suggestion. My only difficulty is to know, not what to say, but what not to say. I shall, however, trust to your indulgence, endeavouring not to exceed a reasonable time, and to dwell in greatest detail on those points which will most interest a scientific institution like this. In the first place, as this is the first public occasion since we obtained possession of the obelisk, on which I have had the opportunity of speaking, I think it is but meet that we should accord to His Highness the Khedive of Egypt our warm thanks for the gracious liberality with which he placed the obelisk at our disposal, and received all our suggestions, and for the very warm sympathy and interest which he has evinced in the removal of this obelisk. It was the earnest desire of his illustrious grandfather, the great Mehemet Ali, to see this obelisk removed to England. Mehemet Ali, remembering the exertions made by the British Army in 1801, at the close of one of the most brilliant cam-

paigns that it had ever fought, to bring this obelisk home with them as a monument of their success, endeavoured to get the English nation to accept it and remove it. They neither accepted it nor removed it. Our thanks are also due to Mr. John Fowler, the eminent engineer; and especially are they due to the Hon. Crespigny Vivian, Her Majesty's Consul-General in Egypt, a member of one of your Services, for the interest he has taken in our enterprise, and for the assistance he has given us. Whilst recording our thanks to those who have assisted us, I must not forget to include that courteous Greek gentleman, Signor Demetrio, on whose land the obelisk lay. He has given us every assistance. He has expended a very considerable amount of money in helping us, when he might have been a very awkward impediment in the way, notwithstanding the goodwill of the Khedive.

Now, sir, what is this monument that we are trying to get to London? It is the oldest monument now in Europe or Asia which records upon its face the history of its birth and parentage. It ought, therefore, to be an interesting monument.

Seven hundred miles up the Nile, the country is crossed by a ridge of granite, possessing peculiar consistency,—exceptionally free from flaws and cracks. It is there that the Nile bursts through it in the first cataracts, and it is from this ridge of granite that all the obelisks worthy the name, that the world possesses have been carved. Above As-suan, in the quarries in this region, there now rests a monster obelisk, which, had it been finished, would have vied with the old Flaminian, or the Lateran. Two of its sides are squared, and the grooves are cut in which the wedges were to have been inserted to separate it from its natural bed. This obelisk would have been about 120 feet long and 11 feet square. Now, for many years I have taken an interest in the old monuments of Egypt; and circumstances did occur which enabled me to visit that land some years ago. I looked at the position in which this Alexandrian obelisk—which we may call ours—was lying: and I thought it was a pity that so interesting a relic of an olden time,—so interesting a record of the genius and engineering skill of the men who could quarry such blocks of stone, could move them with ease from place to place, set them up and take them down as they did, should be lost to posterity—for the handling of such pieces of granite as any of these obelisks, is no child's play, to say the least. Our obelisk has a weight of about 200 tons. I therefore, as I say, thought to myself, that this piece of stone ought to be preserved to England, and that I should like, at some future day, to see it set up in the home of modern engineering, in this our city of Westminster.

If such be its merits as an engineering monument, what shall I say of its interest as an historical monument? We have recently seen such full descriptions of its history in the journals, that I need not detain a scientific gathering like this by dilating upon matters to which you are as familiar as myself; but I will claim a minute or two just to bring to your minds a few of the principal dates connected with its history, because the question may be asked—nay, it has frequently been asked,—“What is the use of this battered old stone?”



"Why should we take all this trouble about it?" As if every national monument of such a people as the ancient Egyptians were not of priceless worth, especially a grand, historical, and even chronological landmark, like this colossal monolith! We do not live for the day alone, but as beings gifted with large discourse, we look before and after. What is it that is one of the strongest incentives to duty, that "stirs the imagination and nerves the will of the members of those distinguished services I have the honour of addressing, but the impulse to write on to-day's page of history, names comparable to those with which its earlier records glisten?" Hence we want a past to look back to, as we hope ourselves to make a glorious past for future generations to emulate. "The child," says Wilhelm von Humboldt, in a striking passage quoted in his illustrious brother's "Cosmos," "longs to pass the hills or the seas which embrace his narrow home; yet, when his eager steps have borne him beyond those limits, he pines, like the plant, for his native soil; and it is by this touching and beautiful attribute of man—this longing for that which is unknown, and this fond remembrance of that which is lost—that he is spared from an exclusive attachment to the present." Gentlemen, the best answer to a question hardly needing or deserving any reply is a slight sketch of this obelisk's history.

Fifteen hundred and fifteen years before Christ, on the 7th of May, the greatest monarch of his time, Thothmes III, ascended the throne of the Pharaohs. To celebrate a grand recurring festival, which fell but once in thirty years, having caused this stone to be quarried at Syene, he set it up, with its fellow obelisk, in his imperial city of On, as the crowning triumph of the day, on the 28th of August, B.C. 1502. Curiously enough, it was almost exactly thirty-three centuries before the battle of Alexandria. Two or three hundred years glided by, and then came Ramses II, the great Sesostris of the Greek and Roman historians, who did him homage as the mightiest of Egyptian heroes and conquerors. Sesostris could think of no more honoured place than these obelisks at On for recording, in the same mysterious hieroglyphic character which the genius of Champollion first taught modern Egyptologists, like my friends Dr. Birch and Mr. Basil Cooper, to decipher, the glories of his reign. Heliopolis, or On, was the only university of the world. To that university-city came Joseph, and thither he brought his brethren; thither, too, he brought his father Jacob. It was the imperial city of Lower Egypt. After Joseph, Moses was sent thither, the adopted son of the Pharaohs, to learn all the wisdom and science of the Egyptians. After him Euclid, Eudoxus, Pythagoras, Plato, Herodotus, and a host of others, whose names are illustrious in ancient history, came thither to study. Twelve centuries from Sesostris saw something of the decadence and the fall of On; and so we come, after passing by such names as Cambyzes, the great Persian conqueror, to the time of the famous Queen of Egypt, Cleopatra, with whose history the name of this obelisk is so intimately associated. Forty or fifty years before Christ, she tempted the great Julius Cæsar, and afterwards Mark Antony, to visit Egypt, and she, no doubt, initiated the removal of these two obelisks from On to decorate the temple of her deified lover, Cæsar, which she founded

in the then great metropolis of Egypt—the Greek city of Alexandria—to which had been transferred, in all probability, the library, the professors, the learning, and the wisdom that had been accumulated and concentrated at Heliopolis. The battle of Actium cut short her reign and her life; and it was not known until my brother, in some excavations which he made in the course of our removal of our English obelisk, had the good fortune to discover one of the bronze crabs which the Romans had put under the corners of the standing one to support it, and found an inscription on the large claw of one of the crabs, that, in the eighth year of Augustus Cæsar (B.C. 23), Barbarus, the Prefect of Egypt, caused these obelisks to be erected by Pontius the architect. One of my good friends, writing to me, has adduced a course of argument, which, to him, makes it very clear, that the Pontius who erected these obelisks at Alexandria was the grandfather of the Governor of Judea, the celebrated Pontius Pilate. Whether it be so or not, I do not know; but one thing does strike me in considering the grandeur of the great Cleopatra's reign, and especially her fine buildings, viz., the truth of a reflection in the work on obelisks by Mr. W. R. Cooper. He observes that whenever the reins of supreme power have been held in the hands of a woman, it has, in all periods of history, been exercised with singular skill, with singular discretion, and has been marked by works of singular magnificence.

I have now brought you down to about the time of Christ, when this obelisk was set up in Alexandria. How it came to be thrown down we have no record; and we must pass on over eighteen centuries to arrive at the time when history again enables us to refer to the vicissitudes which have befallen it. Two obelisks were placed at the entrance of the great temple of the Cæsars, to decorate the Water Gate. One of them is still standing on a base, the model of which you see before you; it is a counterpart of the base on which the dummy obelisk I have erected on St. Stephen's Green is placed. You therefore see, that that base is no suggestion of any modern architect's brain: it is a copy of the old bases on which the obelisks stood at Alexandria; and, in all probability, the original bases themselves were moved to Alexandria at the time the pair of obelisks was carried thither from Heliopolis. Whether that be so or no, there they stood; and for eighteen centuries we know little of their history. Probably the obelisk, which is now our own, was thrown down for the sake of abstracting the four bronzes which had been placed at its corners to support it, for why the corners are rounded off, as we find them at present, I cannot otherwise imagine. It is, however, a fact that nearly all the obelisks of Egypt have their corners so rounded, and these bronzes were placed there to support it. I think it very likely that to that cause we may attribute its overthrow. At any rate, nothing was heard of it until 1801, when the Army and Navy of England endeavoured to remove this obelisk as a trophy of their victories. They were stopped in that endeavour, and the matter was then allowed to drop. In 1871 I happened to visit Egypt. I looked at the spot where this obelisk lay: I considered its size, I regarded it

in all its bearings, and I considered it was a pity it should be allowed to go to destruction, for I felt we were not wholly a people who solely regarded the monetary view of a thing, but that we had some feeling and some aspirations above that. I said to myself, "I think 'the time will come when we shall see this obelisk in England.'" I worked on, assisted by my brother and other friends from time to time. We inspired paragraphs in the papers. We took other quiet means of moving in the pursuit of our object; and so we went on until, in 1875, I had the pleasure of making the acquaintance of the distinguished General, whose ill-health, I regret, has prevented him from filling the chair to-day. General Alexander told me what he had done. I found he had obtained a great deal of information. We combined our forces and worked on together, until at last we found ourselves in this position, that we had prepared perfect plans for moving the obelisk. Everything was arranged, but there was still wanting the one essential in all operations of this character—those sinews of war which are absolutely indispensable. It was then that my distinguished friend, Professor Erasmus Wilson, magnanimously stepped in; and to him, and to him alone, if ever this obelisk shall reach—as I trust it may—the shores of England, when it shall be erected here, the thanks of the English nation will be directly due for that monument which they will then possess.

Such being the history of the obelisk, I think no one can say that it is not desirable that it should be preserved from destruction. It is the greatest monument of Egypt's greatest princes, the most interesting record of Egypt's interesting history. As such, I hope that the time may not be far distant when we may see it presented to the English nation as its heirloom for ever, and to the city of London. No doubt difficulties have surrounded us: we have some still to get over; but, in saying that, our thanks are due the more to every one who has hitherto so cordially assisted in the enterprise. I will also say that I do not believe the very good-natured Glasgow gentlemen, in whose hands, owing to our disaster, the obelisk at present lies, will be wanting or will be any exception to the rule.

We may now pass, I think, to the subject of more scientific interest—the removal and erection of these obelisks; and the first question that naturally arises is, How did the old Egyptians do such work? Well, notwithstanding all their bas-reliefs and all their monuments, we have no decisive record of how they moved an obelisk. Obelisks of colossal size, even with the Egyptians, were not very common. They can almost be counted on one's fingers; and we cannot find any record of the mode in which they were erected. The distinguished Director of Art at South Kensington gave us a vivid picture a few years ago, in a painting exhibited at the Royal Academy, of the method of moving one of the great Assyrian bulls, and that was simply by sheer brute force. But in the erection of these obelisks I believe that the Egyptians exercised a little more skill. Egypt is a land where sand is not scarce, and I have long thought that the use of sand would be found possibly to be the simplest and most efficient way of erecting or lowering these monuments. My friend, Mr. Baker, to whose kind

assistance throughout the whole of this work any engineering success—should success ultimately be obtained—will most mainly be due, was talking to me the other day, when he happened to mention the curious fact of the enormous weight that a simple packing case filled with sand will support, and of the pressure that must be brought to bear upon it before it will burst. It struck me that a very simple solution of the problem before us may be arrived at from that little fact. Instead of raising a big mound of sand round the entire obelisk, the building of two slight walls on either side and the filling in of the interstices with sand would almost suffice to do the whole thing. For you will see as the obelisk begins to rise from the horizontal, so rapidly does the weight which you have to handle diminish, that after you get it to about that position, say about sixty degrees, you will not have more than a third or one-fourth of the whole weight to operate upon in order to haul it by ropes over to the vertical. I think very likely some such plan as that was adopted, because we do know that the ancient Egyptians always resorted to the simplest and most primitive way of achieving their objects. Well, then, after the Egyptians came the Romans. The Romans had to operate in a different country, and adopted different means, because successful engineering simply means the employment and adaptation of the materials which are most readily at hand. What might be good in Egypt would not be good on St. Stephen's Green; what might be good here would not be good in Rome. The Romans had the Apennines at their back; they had great forests of timber, and they erected their obelisks by the free use of that material. I have here through the kindness of Professor Donaldson, who has taken a great interest in our work, a very interesting old engraving of the plan of erecting the old obelisk of the Vatican by the architect Fontana, in 1586, and you will be able to trace it without any elaborate engineering explanation. They built round it a pile of timber higher than the obelisk which they had to lift. They lifted it by blocks, ropes, and tackles, by the employment of the joint labours of 1,500 men and 140 horses, into its place in about a month. Then the French improved upon that. The French plan of erecting their obelisk in 1836 was not materially different from Fontana's; but they did considerably economise material. They did not build the staging above the obelisk, so that they could get hold of it with ropes and hang it from the top; but they ingeniously devised some shear legs that would rise and fall as the obelisk ascended. Practically, however, it was the same system as that adopted by the old Romans. Since 1836, considerable changes have taken place. Various mechanical contrivances have been invented, and new materials produced for our use, and it would not do for us at the present time to remove our obelisk by plans which sufficed even forty years ago. We must resort to something different, and not only must we do so, but we have no reason to adhere to the old plans; for we have now facilities in the utilisation of iron and mechanical tools which, even forty years ago, were unknown. Therefore, when this obelisk had to be moved, I looked upon the site on which it lay, and saw it reposing behind an old quay wall at Alexandria.

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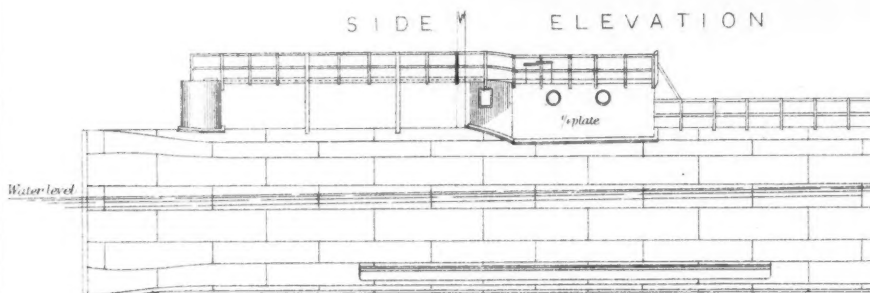
assistance throughout the whole of this work any engineering success—should success ultimately be obtained—will most mainly be due, was talking to me the other day, when he happened to mention the curious fact of the enormous weight that a simple packing case filled with sand will support, and of the pressure that must be brought to bear upon it before it will burst. It struck me that a very simple solution of the problem before us may be arrived at from that little fact. Instead of raising a big mound of sand round the entire obelisk, the building of two slight walls on either side and the filling in of the interstices with sand would almost suffice to do the whole thing. For you will see as the obelisk begins to rise from the horizontal, so rapidly does the weight which you have to handle diminish, that after you get it to about that position, say about sixty degrees, you will not have more than a third or one-fourth of the whole weight to operate upon in order to haul it by ropes over to the vertical. I think very likely some such plan as that was adopted, because we do know that the ancient Egyptians always resorted to the simplest and most primitive way of achieving their objects. Well, then, after the Egyptians came the Romans. The Romans had to operate in a different country, and adopted different means, because successful engineering simply means the employment and adaptation of the materials which are most readily at hand. What might be good in Egypt would not be good on St. Stephen's Green; what might be good here would not be good in Rome. The Romans had the Apennines at their back; they had great forests of timber, and they erected their obelisks by the free use of that material. I have here through the kindness of Professor Donaldson, who has taken a great interest in our work, a very interesting old engraving of the plan of erecting the old obelisk of the Vatican by the architect Fontana, in 1586, and you will be able to trace it without any elaborate engineering explanation. They built round it a pile of timber higher than the obelisk which they had to lift. They lifted it by blocks, ropes, and tackles, by the employment of the joint labours of 1,500 men and 140 horses, into its place in about a month. Then the French improved upon that. The French plan of erecting their obelisk in 1836 was not materially different from Fontana's; but they did considerably economise material. They did not build the staging above the obelisk, so that they could get hold of it with ropes and hang it from the top; but they ingeniously devised some shear legs that would rise and fall as the obelisk ascended. Practically, however, it was the same system as that adopted by the old Romans. Since 1836, considerable changes have taken place. Various mechanical contrivances have been invented, and new materials produced for our use, and it would not do for us at the present time to remove our obelisk by plans which sufficed even forty years ago. We must resort to something different, and not only must we do so, but we have no reason to adhere to the old plans; for we have now facilities in the utilisation of iron and mechanical tools which, even forty years ago, were unknown. Therefore, when this obelisk had to be moved, I looked upon the site on which it lay, and saw it reposing behind an old quay wall at Alexandria.

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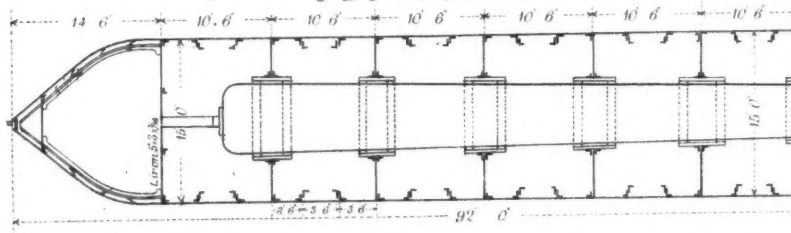


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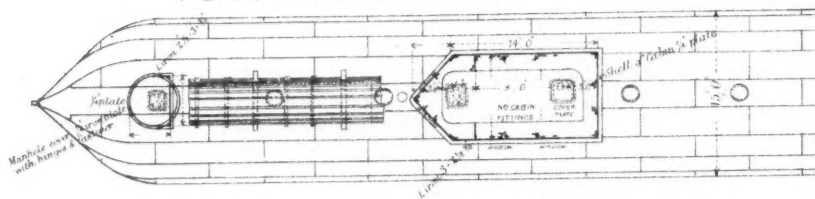
SIDE ELEVATION



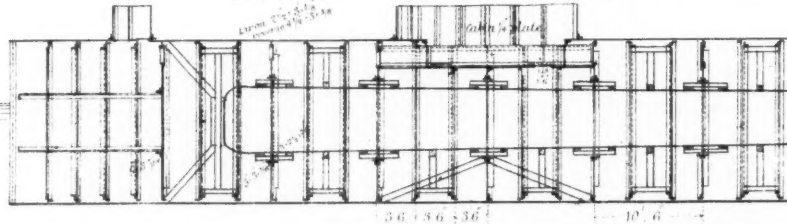
HORIZONTAL SECTIONAL PLAN



PLAN AND SECTION THROUGH CABIN



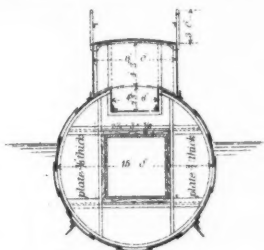
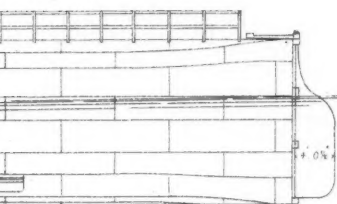
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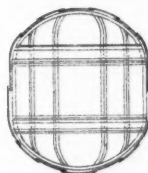
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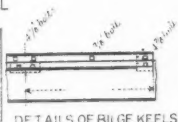
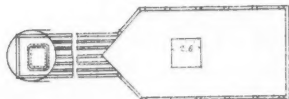
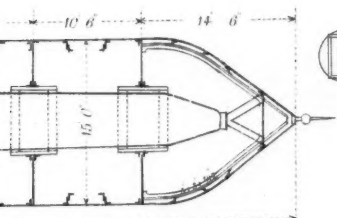
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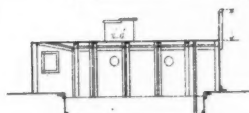
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PLAN AT DECK LEVEL



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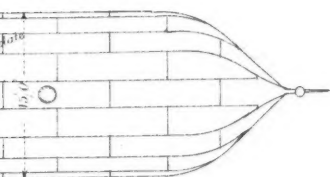


LONGITUDINAL SECTION OF CABIN



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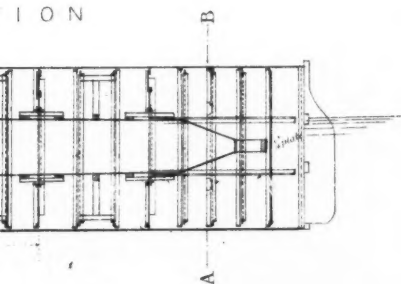


LINE AT BOW AND STERN



SECTION OF GALLERY AT STANDARD

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GENERAL SECTION OF GALLERY

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The waters of the Mediterranean washed the foot of that wall; but the depth at which a ship competent to carry such a stone could approach, was far distant. How to get the vessel to the obelisk, or the obelisk to the vessel, was therefore the question. The bed of the sea was sand; but under that sand, at a depth of a few feet, lay a bed of stone, and engineers in the present company will readily understand that to dredge the sand in the face of the strong side current was difficult with the rock underneath, and to blast the rock with the sand above it was equally difficult. It would have been a costly process; and then, even if the canal had been made, what was the ship that we were to get into it, in order to carry the obelisk? We were on an exposed coast with a heavy sea. We had a strong set of the current carrying in the sand; and we had also the fact that although our obelisk only weighed about 200 tons, as you may readily understand, a vessel able to carry 200 tons in one solid piece, would require to be a big ship. It would require her to be peculiarly strengthened, and we should at once get into very great expense. Also, we should get into great expense if we had tried to remove it through Alexandria. We could not have carried it through its narrow and tortuous streets without the expenditure of a fabulous amount of money in straightening the route; therefore, it was clear something different would have to be resorted to. It at once occurred to my brother and myself, that the simplest plan would be to let the obelisk lie where it was, and to build round it a cylindrical vessel in which we could enclose it, and which cylindrical vessel should have sufficient strength to stand rolling over the sea-bed until it reached a depth of water sufficient to float it. This seemed practicable and simple; and ultimately, after considering the whole question, we determined that that was in fact the only way in which, at any moderate cost, this obelisk could be put afloat. The crude ideas of the initiation of any undertaking are, of course, capable of material improvement, and the plans which we formed at the beginning of our labours were considerably different in many minor respects from those which were ultimately carried out; but in the main point the idea was the same. We knew that we had to enclose this stone in a vessel that should be strong enough to resist rolling on the dry land, and strong enough to resist pitching when it should be afloat at sea. That required a considerable amount of calculation, but I took my tried friend Baker into my confidence, and we found that there would be no insuperable difficulty in carrying it out. We found that, perched up on the top of a wave, we should not have, under any circumstances, more than  $\frac{1}{10}$  inch of deflection in the length of the vessel which we designed. We knew by calculation that we should not have more than  $\frac{3}{4}$  ton per square inch of section of strain on the iron of that vessel at any point under the most adverse circumstances, and the investigations of the eminent chief engineer of Lloyd's have shown clearly that many of our ordinary and best known ships are exposed to strains of ten times that amount. Therefore, we came to the conclusion, that in trusting this old monument to such a vessel, we were not running any risks, or trying any novel experiment and endangering its stability,

and we felt that if this vessel should not have more than  $\frac{1}{10}$  or  $\frac{1}{8}$  inch deflection while she was supported amidships, perhaps on the top of a wave, or lying in the hollow with her ends supported, nothing more than that could, by any possibility, be brought to bear on the stone which was to be her cargo. However, we provided not for  $\frac{1}{10}$  inch but for nearly 4 inches of possible deflection, and gave the stone an elastic cushion, which, under all circumstances, we felt might confidently be relied upon. Although the vessel is not home, yet she has survived rougher usage than in all human probability she can ever experience again, and we think that that experience may be appealed to as some proof of the correctness of our calculations. The vessel was made 15 feet in diameter and 93 feet long, which we found was a sufficient size to ensure the necessary buoyancy and the necessary flotation. We divided it into ten watertight compartments, and by this model you will see that the stone as it passes through each of the diaphragms, is supported by a wooden wedging and packing, which gives the necessary elasticity, so that if the centre of the ship were bent or struck, it might deflect to the extent of three to four inches before any unreasonable strain was brought upon the stone. Each of the nine bulkheads is made watertight, and between the bulkheads we have got two frames carried right round to ensure the stiffness of the plating. Now it must be perfectly apparent to any one that a tubular form gives the greatest strength, and that by adopting that form, avoiding all straight surfaces in the parts upon which a strain could come, we were making the greatest economy of materials. The hull was placed round the Needle; for all we did was to let the old stone lie. We did not attempt to disturb it, except that as it was not lying quite parallel with the sea, we brought the end of it round, lifted it up on some wood, and cleared away the sand. We then set to work, and put these diaphragms round it, and after we had fixed a few of the centre ones we riveted to their periphery the iron shell of the ship. As we went on towards each end building up this great round rolling-pin we cleared away those chocks which supported it, and moved them back to the part which was finished. So, by degrees we proceeded, until at last we had a round iron structure something like an enormous boiler, with the ends sloped off, lying before us. We had then no cabins or masts upon it; but we had this to contend with, that for the sake of the future requirements of the vessel we had put the stone four inches out of the centre. Instead of building the vessel exactly round the centre of the stone we had built the vessel four inches above the centre of the stone. The top plating of this vessel is also not so thick as the bottom plating; consequently it will be at once apparent that we had this difficulty to provide against, that as it was rolled down the sloping sea beach into the water, we had to fear, as soon as ever the heavy part got over the perpendicular, a great lurch forward, which would have been inconvenient. We therefore made a recess in the round skin, where the cabin was afterwards to be built, just sufficient to hold the necessary quantity of old rails packed close in that recess, to counter balance this inequality. These old rails would afterwards, when she came to be afloat, and they were trans-

ferred to the bottom of the ship, serve as the ballast to keep her permanently and safely in the position which we desired. The launch was successfully carried out. Some little difficulties, as always is the case in these matters, did occur. We had foreign workmen to contend with, with whom we could not converse as readily and as intelligibly as I can talk to you, and it did, I will not hesitate to say, so happen that although we had provided ten watertight compartments, and made them perfectly watertight, yet one little circumstance neutralised all our care. We had arranged that any compartment might be pierced by any of the stones lying on the beach over which we had to roll it, we had removed a great many of the largest stones, though no doubt there were stones almost covered with mud and sand which we could not see, and which when the weight of the vessel came upon them would be left standing up. We foresaw that, and we put round the cylinder on the two points where it was likely to take the greatest weight, a skin of timber. But we were not to get off scot free; and within about twenty yards of the point where the vessel was to have floated—after rolling it, I should think more than 200 yards—a stone pierced the hull just past the end of this timber, and filled the compartment with water. Now I shall never be hard, and never be severe, on any naval captains, or anyone else after what occurred. There were six or seven of us, with every inducement to pay every attention to that vessel. There was Mr. Waynman Dixon in actual charge of the operations, the others looking on. We had provided bulkheads, we had provided watertight doors through them, and we had so carefully managed that the man whose duty it was to close these doors had forgotten to do so, and all were left open! There is nothing like confession, because it may induce other people under similar circumstances to avoid such mistakes; but so it was. Therefore as soon as ever a hole was made in this end compartment, the whole ship filled, and we had a waterlogged vessel lying within two feet of flotation, carrying 300 or 400 tons of dead weight in 9 feet or 10 feet of water, to operate upon. However, there is an old saying that Providence helps those that help themselves. We fortunately did not encounter any rough weather, and the measures which we took for getting her into deep water were very soon successful; but this little misfortune and consequent delay, prevented His Highness the Khedive of Egypt from being present at the final floating out of dock, which he had heartily hoped to witness.

Such being a general description of the vessel, and of the operations which we conducted, I may now be pardoned if I draw attention to a few of the more scientific questions which arise, and to be clear on these I have taken the precaution to put them into writing.

It will be seen that a circular form of ship was suggested, or it might almost be said dictated, by the plan of building and launching determined upon as the cheapest and best under the peculiar circumstances of the case. It can easily be shown that, apart from the latter considerations, the circular form offered many advantages.

In the first place, weight for weight, no other form of ship could compete with the tubular one as regards strength and stiffness; the latter an especially important desideratum when the load is a monolith,

as in the present instance. The plates being everywhere curved, and consequently well adapted to resist fluid pressure, we were enabled to dispense with one-half the number of frames prescribed by Lloyd's rules, and to lighten the construction in other respects. Indeed, from an engineering point of view, the advantages of the tubular construction are self-evident: it is only when we look at the matter from a sailor's point of view that the necessity of a most careful and scientific investigation of the whole question becomes apparent.

We had no direct experience to guide us as to the probable behaviour of our little ship. It was necessary to rely upon theory, and events have proved our guide to be thoroughly trustworthy. It may be interesting to refer briefly to some of our conclusions.

The question of rolling was obviously the all-important one in the present case. A circular ship must evidently be the easiest to roll in water as on land under the influence of an applied force. Our circular vessel, unloaded and unballasted, could be turned round and round in the water, like a treadmill, and the only resistance to the movement would be the "skin resistance" of the iron plates and the so-termed "keel resistance" of the pinched-in ends, which would absorb a small amount of force in churning up the water fore and aft. A ship of rectangular cross section—a square tube in short—similarly unloaded and unballasted could not have been so rotated, because of its inherent stability of form. Again, suppose we put an equal quantity of ballast in the two ships, heel them over forcibly to a given angle and let them go simultaneously, which would come to rest the quickest? Obviously the square ship, for it could not roll without displacing large volumes of water at each oscillation. A great wedge of water would have to be displaced on the depressed side and a corresponding vacuity into which the water must rush, would be formed on the other side, and so waves would be generated, which would absorb power and gradually extinguish the movement of the ship. There would be nothing of this kind with the circular ship.

The principles of mechanics show that the circular ship would, it is true, generate some waves by reason of a slight lateral movement of the axis of the cylinder, but the waves would be relatively insignificant in size and absorb but little power. The circular ship would, therefore, be practically dependent upon skin-friction to bring it to a state of rest, and this retardation is of course shared in alike by the square or any other form of ship. In one sense of the word, then, a circular ship may be said to be the worst for rolling which could be devised, because she would be easily started and not readily stopped. But is it in this sense of the word that we are concerned? We are clearly not interested in knowing how quickly or how deeply we could roll our ship, by marching crew from side to side on her deck or by pulling at her from the shore. What we want to know is how much the waves will roll her if we abandon her to them, and let them do their worst, and that is a very different thing. Looked at from this point of view, the circular is the very best instead of the very worst form as regards rolling, but to make this clear it will be necessary to say a few words about waves.



When water is at rest the different particles are acted upon by gravity alone, and as they are affected equally, the surface of the water is necessarily horizontal. When waves are formed, the different particles are affected by gravity as before, but combined in this case with the centrifugal force due to the circular movement of the particles in the wave, and the surface of the wave assumes a position at right angles to the resultant of the weight and centrifugal force. If the particles of water at the surface of a wave are in equilibrium when standing at a slope instead of horizontal, as in still water, so will any body floating on the surface of the wave be in equilibrium. For instance, a man standing on a raft floating on the surface of the waves would not have to find his "sea legs," or maintain a vertical position by bending his knees alternately as the raft tilted to the one side or the other, he would simply stand square to the raft at all times; and so when on the slope of the wave he would be inclined inwards just as is a rider in a circus, and for similar reasons. If the man held a plumb-bob in his hand it would not hang vertically but at right angles to the surface of the wave, and from the operation of the same forces every ship which tends to stand vertical in still water tends with equal force to stand perpendicular to the "effective wave slope" in disturbed water. It is necessary to draw a distinction here between the "effective wave slope" and the "surface slope," because the ship, unlike the raft, is affected by the deeper layers of water.

It is quite unnecessary to involve ourselves in the difficult and obscure theory of the reaction of the particles in a wave. It is sufficient for our purpose to know that it has been clearly established, by the profound investigations of Rankine, Froude, and others, that the same attributes which tend to keep a ship steadily vertical in still water will tend to throw her forcibly out of the vertical on a wave slope. In other words, a very stiff ship will be a very bad roller. This theoretical truth has been but too frequently exemplified in practice. The early ironclads, both of England and France, were enormously stiff, and, as a consequence, rolled perhaps  $60^{\circ}$  and made 12 or 13 rolls a minute, whilst our modern and relatively unstable ships would, under the same circumstances, roll but one-third as fast and one-third as deeply. We may take it then as proved, that an unstable ship is, in virtue of its instability, steady amongst waves, and we might reasonably conclude, as we did, that our cylindrical ship would, from its exceptionally unstable form, roll to an exceptionally small extent, unless we spoilt her by over ballasting or a bad distribution of the weights.

Suppose that our tubular ship was of uniform thickness, and that the Needle was placed exactly in the centre, she would then have no stability, but neither would she be affected by the waves, which would simply move her up and down gently as they rolled under her. She might turn round a few times daily, as a general resultant of the action of the wave particles and the skin-friction, but she would not roll at all in the usually accepted sense of the word. But, as we intended to put a cabin on the top of the cylinder, it was obviously essential to keep her right-side-up, and the important question was,

what was the happy medium, in the way of stability, which would make the ship stiff enough to stand up against a gale and yet leave her crank enough to roll little, if any, amongst the waves.

After a careful consideration of the question in all its bearings, it was decided to give the ship a metacentric height of 9 or 10 inches, or, in other words, to fix the centre of gravity at that distance below the centre of the cylinder. It is hardly necessary to remark, that the stability so provided is exceptionally small, and that some excellent authorities thought we were taking a rather bold step in so limiting it. Experience has, however, fully justified the course we adopted. The obelisk was placed about 4" below the centre of the cylinder, and when the latter was towed round from the old site of the obelisk to Alexandria harbour, the stability was wholly dependent upon that position of the obelisk and upon the little extra weight in the bottom plates of the cylinder. There was no ballast whatever in the ship, and her metacentric height could hardly have exceeded 4 inches, for the top of the cylinder was covered with Maltese and Arabs, who sat quietly on the iron skin, with nothing to save them if the vessel had made a roll, which she never did to the smallest extent, though the beam-sea was so heavy that the tugs accompanying her rolled sponsons under.

When the "Cleopatra" left Alexandria for her homeward voyage she had 20 tons of iron ballast on board, and her metacentric height, or what is the same thing in this case, the distance of the centre of gravity below the axis of the cylinder, was 9 inches. Her total displacement was about 290 tons, and the radius of gyration was 4.75 feet. These elements are all that are required to enable us to form an estimate of the "period of the ship" or the number of seconds in which she would make a roll from starboard to port and back again. The "period" of a ship is a very important factor in her sea-going qualities, and it is always ascertained for every ship in our own and foreign navies. A slow-rolling ship is not only a more comfortable ship, but also a safer one, as she is less likely to suffer from the accumulated rolling which occurs when a vessel is amongst waves of the same period as herself.

There is an obvious analogy between the rolling of a ship and the swinging of a pendulum; all we want to know is the length of our pendulum. It might at first appear that the lower the centre of gravity below the axis of our cylindrical ship, the longer would be the pendulum, and the slower the oscillation of the ship, but exactly the converse is the truth. The number of double rolls a ship makes in a minute is directly proportional to the square root of the metacentric height, so that, if we doubled our stability by lowering the centre of gravity, our ship would roll  $\sqrt{2}$ , or 1.4 times as fast as before. The number of rolls is again inversely proportional to the radius of gyration. The length of the pendulum which would oscillate in the same time as a ship rolls in still water is simply obtainable by squaring the radius of gyration and dividing the product by the metacentric height. In our case it is 4.75 feet square divided by .75 feet = 30 feet. Now, a pendulum 30 feet long makes a double oscillation in  $6\frac{1}{10}$  seconds,

and we therefore may conclude that the unresisted rolling of the "Cleopatra" would be performed at the same rate.

The addition of bilge-keels and the skin-friction causes some water to accompany the rolling ship, and so, in effect, adds to the moment of inertia and increases the period of the ship. It may be added that 6 seconds is an exceptionally good period for a ship of the size of the "Cleopatra." Very few gun-boats roll so slowly, and many of the earlier ironclads, in our own and foreign navies, rolled faster.

Our investigations led us, therefore, to anticipate that the "Cleopatra" would, from her unstable form and high centre of gravity, roll but little when amongst the waves; and that if she were started rolling by the wind, or otherwise, she would roll easily and slowly. Events have justified these conclusions.

As regards pitching, greater difficulties presented themselves. We could not stow our cargo as we liked, or, in the interests of the comfort of the crew and ease of stowage, we should have broken the needle in two and stowed the two halves side by side in the centre of the ship. However, we were compelled to carry the obelisk intact, and to put up with the resultant pitching and discomfort. In order to ease the ship as much as possible in lifting to the waves, the obelisk was stowed thick end foremost, so as to take advantage of the law, that dynamical forces vary as the square of the velocity, and not as the velocity simply. To illustrate the effect of this, imagine the needle-ship, when resting in smooth water, to be seized by the stem and lifted up by a force sufficient to impart to the bows a velocity of say one foot per second, and suppose, farther, the stern to be similarly lifted up, then, upon a comparison of the intensity of the two forces required to impart the given velocity, it would be found that it was about seven per cent. easier to lift the bow of our ship than to lift the stern. It is not unreasonable to assume that easiness of pitching would, other things being the same, be proportional to the ease with which the bows rise to the waves; and that by stowing the obelisk as we did, an appreciable advantage was obtained.

It is only fair to remark that, in consequence of a slight leakage at stem and stern, a considerable quantity of concrete was unfortunately filled into the extreme compartments of the ship in Egypt. This un contemplated modification of the design, of course, added seriously to the severity of the pitching. It was equivalent in effect to hanging the best bower anchor of one of our largest ironclads over the bows of our little ship, and a similar anchor over her stern, and probably if those who had charge of the ballasting had seen the weight in that form they would have found some means of getting rid of it.

The form of bow obtained by "pinching in" a ship a circular cross section is obviously not the most favourable as regards pitching, because the lifting force is less than in a bow with vertical sides, and the water acts on the back of the cylinder and weighs it down. To remedy these defects as far as possible, the bow was made as full as was consistent with a reasonable expenditure of power in towing, and a turret was placed on it to split the seas and throw the water off the forward end of the ship. Captain Carter reports that the desired ends

were achieved, as the ship, after plunging into a wave, rose at once, and shook the water off her back "like a duck."

The preceding brief review of the considerations which led to the design of the needle-ship will, it is hoped, afford a sufficient justification of the perfect confidence with which we entrusted the valuable and irreplaceable cargo to her. Had the ballast not shifted, she must, humanly speaking, have been certain to do the work with safety and dispatch. Unhappily, the tendency of the ballast to break loose was under-estimated by those who stowed it, and perhaps not unnaturally so; for M. Bertin, the great French authority on rolling, has stated that, in order to keep matter in place in rolling, we must reckon on efforts at least equal to two-thirds of the weight for the hull, and to four-thirds for the masts, even in still water; and of course at sea the stress will be far greater. It is more a matter of regret than surprise, therefore, to find that the ballast broke loose in the fearful weather encountered in the Bay of Biscay.

I may perhaps simply illustrate the few remarks I have made by a diagram which I have prepared here. I said that standing on a raft lying on the slope of a wave a man would not require to shift his sea legs, but he would simply stand at perfect ease, and for this reason. Suppose I have a trough half filled with water up to that level, and on the top I have two supports, one carrying a ball suspended in that position, the other carrying a ball suspended in this position. Now I take that trough in my hand, and I give to it practically the centrifugal force which the particles of a wave possess: what occurs? You will see at once that the water will fill itself up at the far end of the trough, somewhat in the position I have shown here, and you will also see quite clearly that that weight will swing itself into that position owing to the result of the same centrifugal force. When the water is in that form, or when the part of a wave surface is created, the body which is floating on it is influenced by the same force, and stands still perpendicular to it, just as it did when it was vertical on the surface and the water was horizontal. But mark this. There the weight is suspended by a thread. What is the result, if, instead of being suspended by a thread which can swing out, it is suspended by the centre, or an equal weight placed upon it? If I had two equal weights on the end of this stick and send it round as fast as ever I choose, it will be perfectly apparent to you that the vertical position of the stick will remain the same; it would never be changed. The case would be very different if I had the weight suspended from the bottom, and took hold of the stick at the top. There it would swing out in proportion to the centrifugal force; so that in this illustration I have endeavoured to show the effect of the position that a body assumes on the surface of a wave; and if you will regard this as the centre of buoyancy of a vessel, or rather as her metacentre, and regard this as the centre of gravity of the weight of that vessel, you will find as those two centres approach each other, or get into equilibrium, the vessel has a tendency to become stable, or rather to rest steady in the position in which it was. It has no tendency to have that position disturbed; but in this case where there is a great differ-

ence between the metacentre and the centre of gravity, there the slightest force brought to bear, at once tends to throw out the centre of gravity beyond the metacentre, and to pitch the vessel. But it must be perfectly apparent to you all, that in still water this weight which is hanging over the centre will have a far greater tendency to keep in that position than the weight which is supported on its centre. Very little will make this swing, as a very little would make our ship roll in still water. It requires a great deal of force comparatively to make this move, and hence you have the difference between the two points, and have a low metacentric height and great steadiness, and great metacentric height and great stiffness. Stiffness and steadiness are in contrast the one with the other.

The Needle-ship at present rests at Ferrol. I do not know when she may be here, but I think you may reasonably look to her appearing in England. When she does arrive alongside the Thames Embankment, the circular form of our ship holds us in good stead, the same as it did at the Alexandrian end. We shall float it at high tide on to a stage, let it rest on the stage, strip off all its excrescences, and then we have nothing but a round cylinder that we can roll, as we did before, wherever we may land it, and we can get it to the site upon which it is to be erected. Now imagine that the obelisk is on that site. I am going to explain to you, if I can, the plan we purpose adopting for erecting the monument. We shall have the obelisk, we will imagine, lying on the ground. We will strip the remaining skin of the cylinder from it, and we shall proceed to put round it a jacket in iron somewhat similar to this. We shall have the means of lacing these stays so tight, that when the time comes that we have to turn it, endways, and hold it upright, it will grip the stone with sufficient force to prevent its slipping out. We then simply bring into use the most primitive contrivances possible; for they are often the best. We simply put a small hydraulic jack, a thing any two of us could lift, under one end, and we lay a number of timbers across the ground, and then we lift the other end, and do the same. Then we lay some longitudinally, again some across, lifting the stone each time, and so we go on, as you see, gradually rising, until at last we get into a pile of timber something like the model which I have before me, but, I may say, not so close a pile as this model shows. The timber is not damaged; we do not have to cut it. We simply use it for piling, and consequently it will be a very inexpensive process, as well as a very safe and simple one. We raise by that means the stone and its jacket up to the height we require. We have adapted this jacket to the centre of gravity, so that there is a little preponderance at the heavy end. We get it up to about this height, and then you will see in a moment the object of this framework, which is meant to represent two iron girders. If we had a stack of timber, and the Needle lying on it with these trunnions at the side, it could roll round; but it would catch the pedestal as it swung. It requires therefore to be raised a few inches clear, or, what is the same thing, we must have the means of lowering it after it has swung into its vertical position. To get that, we purpose using an iron frame. We shall simply take the ordinary iron girders, rest them

on the wood at one end, and under the other end, we shall put the same hydraulic jacks that we have used throughout for lifting. We shall, when all is arranged, find ourselves with an object before us something like a monster cannon on its carriage. We, having nothing then to do but quietly to allow the obelisk to swing round. We shall not allow it to swing quickly, but we shall have ropes and controlling tackle, which will have a very slight weight to control, as we shall only have two or three tons preponderance at the heavier end. We shall then lower the end of the girders by turning the taps of the two hydraulics which support them, and let down the stone upon its pedestal. Nothing will then remain but to unfurl over it the Union Jack of Old England, "the flag that has braved a thousand years "the battle and the breeze."

Major GRIMSTON: May I ask how it was that the obelisk was found on its beam ends in the storm, and if it was the ballast that shifted, where had it shifted to?

Mr. DIXON: The ballast was stowed, as you see, here, by an arrangement of timber. When the vessel rolled, the rails slipped over to leeward, and the arrangement came loose; as she went over to the other side, the rails followed.

Admiral JASPER SELWYN: Major Grimston has touched on the only point on which I should like to say a word. I do not think it well that this Institution should listen to a paper attacking the grave question of the stability of our ships, without our noticing the anomalies which seem to present themselves. First of all, I wish to congratulate Mr. Dixon on the ingenious manner in which he conducted his operations, and on the success which attended them, so far as he was concerned with the engineering operations on shore. But when we come to the question of the position of the centre of gravity and the meta-centre, I think there are very considerable errors involved in the paper to which we have listened. If those gentlemen who take the trouble to instruct us on the behaviour of our ships floating on the ocean, would be kind enough to say, instead of "unstable ships," "capsizable ships," we should know what they meant; but they befog themselves and us by calling a ship a stable ship which has an inclination to capsize, and an unstable ship the one which sailors would call a very stable ship—one which has no inclination whatever to turn over. Now here, for the purposes of the obelisk, there is no doubt whatever the position chosen for the metacentre was perfectly correct for smooth water, but the centre of gravity might possibly have been a little lower, and answered, without any ballast, just as our iron ships might have been built sufficiently well not to require cement and bricks to be put into them afterwards to keep them on their legs. As to the position which Mr. Dixon has imagined can be taken on a raft, I am sure it is not one which any seaman has ever been able to keep. I think centrifugal force and moment of inertia are not quite the same things. We do find it is necessary to keep our vertical position even on a raft: and it is only because the moment of translation has been supposed to be so excessively rapid as to produce a totally different effect from what it really does, that I believe Mr. Dixon has gone rather astray on the subject. The true fact with regard to the raft is, that it does take the inclination of the wave, and that it does not pitch nor roll in the ordinary sense of those terms; but that it is a bit more pleasant to be upon, a bit less liable to be swept by sea, or a bit less fitted for that stability which is part of its nature, I cannot at all recognize. Then, as to the stowage of the needle. I should like to ask, does Mr. Dixon mean that, in putting the heaviest end of the obelisk forward, he desired to have a greater weight in the bows, in order to ease the pitching?

Mr. DIXON: No; the centre of gravity determined the thing, and having the thick end forward, that end is less in advance of our centre of gravity, so that the end of the stone was further from the end of our ship than if we had put the point that way. The centre of gravity of the obelisk is at one-third of its length. If we



had put *this* end towards the bows we should have had the weight nearer the bows, but by putting *this*, we have a long empty space in front of our ship. (See Plate.)

Admiral SELWYN : I am very glad that I induced Mr. Dixon to make that explanation. As regards the further dealing with the obelisk after its arrival here, which I hope will be safely carried out, I think Mr. Dixon will acknowledge that an engineer would scarcely adopt the same plan for taking it through the streets of London to its destination, as was perfectly efficacious on the shores of an open sea-beach, and that the additional strength of the cylinder would not compensate for the additional difficulty in carrying it to its destination. Probably engineers will take the very easy and well-known plan of laying rails sufficiently strong to bear the weight and take it to its destination in that way. I have the utmost admiration to bestow on the ingenious nature of the mode of raising the obelisk. I think that could not be better done in any way. It is the highest engineering, because it is a contrivance which secures its object with the greatest possible simplicity. For that reason alone I admire it very much. I should wish to say one word with regard to the passage of the vessel from Ferrol. I do not know whether Mr. Dixon has used hemp cables hitherto.

Mr. DIXON : Wire.

Admiral SELWYN : Even steel wire is not equal to chain. I have had some experience in towing, and we found invariably the catenarian curve of the chain cable was brought into play so quickly as to act as a perfect spring, and that when we could not tow with hemp cables, we could tow very comfortably and easily with chain. Steel hawsers of modern days have to a certain extent replaced everything else ; they have great relative strength, and they are very easily handled, but as all ships have not steel hawsers, the chain cables may be useful as a supplement. As the question of carrying persons on board the "*Cleopatra*" seems to have received attention, I would ask whether it was considered necessary to put people on board to watch what they immediately abandoned as soon as the vessel herself was cast adrift. I do not understand why this vessel was not perfectly safe against everything but the point of a rock. I believe she would float to all intents and purposes for the next twenty years on the waves of the ocean without danger, and I do not see that it is any use to have men on board to look on at what must be a very unpleasant operation—towing through a heavy sea—unless they stick to their ship when she is cut or breaks adrift. With these few words, I think I am justified in saying that the sailors of the Institution must congratulate Mr. Dixon on the extreme ingenuity and talent which he has brought to bear on a most difficult engineering operation connected with the seaman's profession.

The CHAIRMAN : As no other gentleman rises, I would ask Mr. Dixon if he can give us any information with regard to the site where the obelisk is to be placed. Some people say that the proposed site is too near the Underground Railway. If he has anything to say as to a more eligible site, we shall be glad to hear it.

Mr. DIXON : Perhaps, before replying to your question, you will excuse me if I reply to the very pithy remarks made by Admiral Selwyn. I know that there is a good deal to be said about a raft, but in a lecture you are bound to cut it short. I am afraid I have been long, and one cannot go into all little details, and the points which cause the exceptions, and at which the truth of the theory you advance ceases to hold good, and I own if you remained upon a raft, it would neither be a comfortable nor a very stable position. But that in certain points on ascent of a wave-slope my theory holds good I think you will acknowledge.

As to towing by steel rope or wire cable I may say that the towing was done, as the launching was done, in great measure by one of the best and finest steel ropes I ever had the pleasure of watching. Mr. Newall was generous enough to present me with one of his very best. It towed without a single break or accident to the cable, and Captain Carter reported to me that if they had had a hemp hawser or anything else they would have had it broken half-a-dozen times. This question of spring was very carefully gone into. I have here very careful calculations as to what the versed-sine of the curve would be at the different speeds of towing, and up to what speed we dare safely venture before our steel rope would break. The same would hold good as to an iron chain ; but strength for strength the chain weighs double as much as the wire ropes does. Now we never did have any difficulty from want of elasticity or



spring, and although a hemp cable might have given us more it could not have answered better than the wire did. As to why the vessel was abandoned, well, I can only say, that if I had been on board I should have done the same. Captain Carter said, I was perfectly convinced theoretically that the vessel would not roll over, but theory had not provided for the ballast being loose, and it was perfectly certain if another sea had broken upon her it would have rolled her over. No doubt she would have righted in time, but the time might have been too long for the passengers, and with a crew of seven men on board to look after, besides myself, I did think it expedient to go on board the "Olga," in fact, if I had wanted to stop on board the "Cleopatra," not one of my men would have stood by me.

Admiral SELWYN: My question was, why you put the men on board?

Mr. DIXON: It was this. You will readily understand as a seaman that towing a heavy lump behind you, which is not steered, is a very awkward thing indeed, and very different from towing a vessel which has men on board to direct it, so that if you have to stop for fear of a collision in passing a vessel, or for any reason have to slow your speed, in the one case you may do it with safety, because you know the vessel following will quietly glide past your side, and in the other case you are put in the awkward alternative of having this unwieldy mass coming on behind you straight, and possibly another vessel to run into right ahead. I conceived it also very probable that heavy weather might require the tow line to be cast off, in which case we should have men on board to show lights in case of collision, danger to yourself, or to other vessels; also to keep the vessel's head to wind as she was perfectly handy; she is not built on the model of an Isle of Wight yacht, but she is fitted with sufficient canvas to hold her own tolerably fairly in a rough gale.

Now as to the site. It is a very difficult question, and the difficulty may perhaps be illustrated by an experience of my own. A few weeks ago I was at an evening meeting of about a dozen architects. Now if there be one special class of men who should be able to give an opinion on a site, it might be expected to be architects. These architects discussed it very fully; each had his own opinion, some of them had two! but all of them agreed unanimously in disapproving what everybody else proposed! so that I am afraid that it would never be possible to get all to agree, whatever site should be selected. If we put it on the top of Primrose Hill, in deference to the opinions of some, we should have dissents; I can only say, though I do not like to cherish any strong prejudices, and am always willing to accord to every one the same freedom of opinion which I claim for myself, that when I see such gentlemen as Mr. Edward Barry, R.A., Sir Gilbert Scott, R.A., Mr. Edmund Street, R.A., Professor Donaldson, and a great many other very eminent architects—the Dean of Westminster, Mr. Poynter, R.A., the Director of Art at South Kensington, John Fowler, the eminent engineer, besides a whole host of others, all unanimously in favour of the Parliament-square site, there seems to me no reason why we should go against the verdict of the most eminent men in the profession, who of all others ought to be best able to give an opinion. And as to the engineering question, it is true that site does stand directly on the centre of the Metropolitan Railway. But let us here mention an interesting fact which came to my knowledge only the other day. Professor Donaldson kindly sent me the section of the great French column in the Place de la Bastille, and curiously the French have selected the top of their big canal as the very place on which to put that column. However, irrespective of what the French can do, Mr. Fowler and the engineers say decidedly that there is no difficulty about placing the obelisk on the top of the Metropolitan Railway; further than that, they say at that point the Metropolitan Railway happens to be imbedded in ten feet of gravel and sand, which scarcely happens at any other proximate point, and with the mass of the railway you have an infinitely better foundation and more stability than you would have if you stuck it up on the top of a little piled foundation. All our public buildings that have been constructed within the last twenty years depend on the endurance of iron, and when a thousand or two thousand years hence the girders we propose to carry that obelisk shall begin to decay, the people of those days, I have no doubt, will be as able to replace them as we were to put them there.

The CHAIRMAN: I think the time has arrived for us to close this very interesting discussion, and I am quite sure you will appreciate the very agreeable lecture to

which we have listened. I congratulate the members of this Institution on being so fortunate as to get this lecture from Mr. Dixon as the opening lecture of the session.

I invite you now to accord your hearty thanks to Mr. Dixon for his instructive description of the obelisk, and all its operations connected with its transport from Alexandria, and his plans for erecting it near this place, and with our best wishes for his success.

NOTES ON THE STEPS TAKEN TO GET H.M.S. "LAP-  
WING" OFF THE ISLAND OF CHANGSHAN, GULF OF  
PECHILI, AFTER HAVING BEEN STRANDED FROM THE  
10TH NOVEMBER TO THE 4TH DECEMBER, 1876.

By Commander Sir W. WISEMAN, Bart., R.N.

I WOULD preface the remarks about to be made on the means proposed and partially carried out for protecting and floating H.M.S. "Lapwing" by a short description of the situation in which the vessel was found on the morning after her stranding.

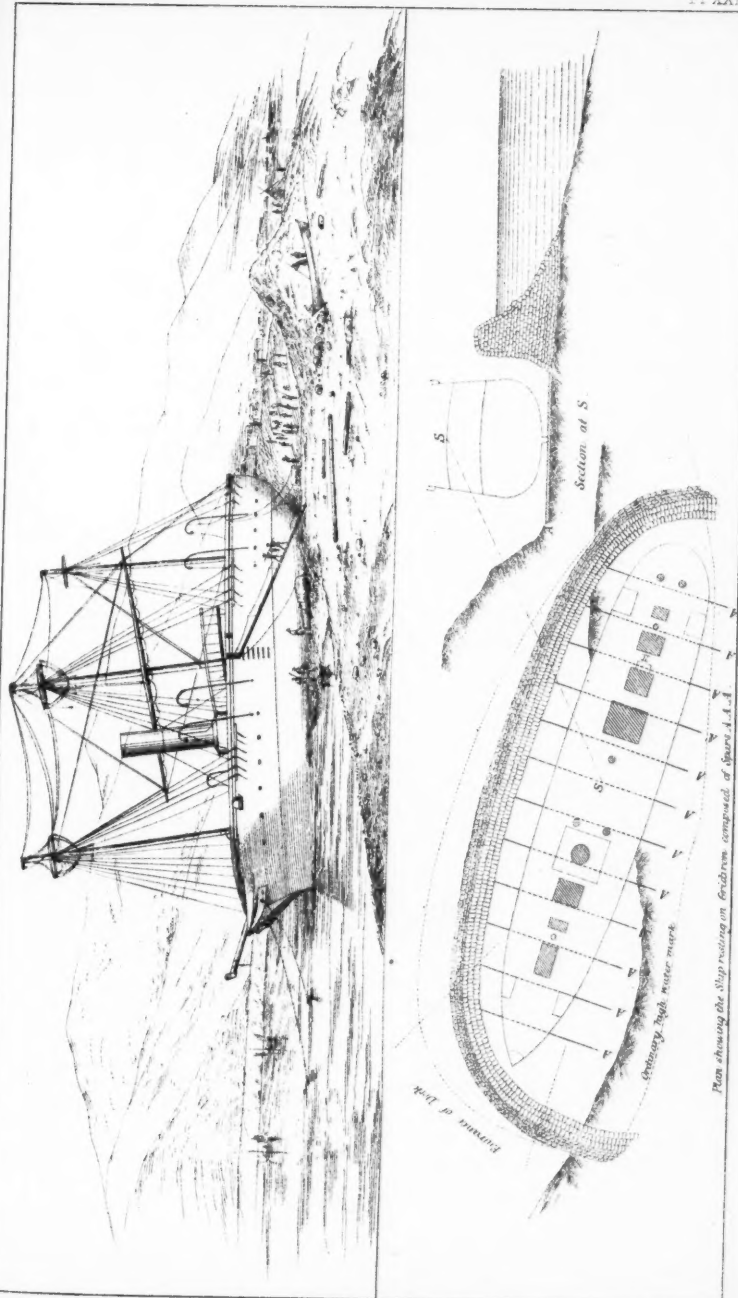
The "Lapwing" had touched the ground bows-on, but a sudden north-east gale springing up without warning—which I have since learnt is a common phenomenon in the Gulf of Pechili—sent a heavy beam sea into the bay, and not only drove the vessel further on shore, but turned her completely round as shown in Fig. 1. This position was revealed to us at daylight, and I must confess to having for a few minutes felt it was a hopeless one, as, to add to our difficulties, the sea was still breaking over the ship, which it continued to do until that evening; however, there was no doubt that the first thing, not being able to lay an anchor out, was to save everything possible, which was at once begun.

Having landed provisions, water, and clothing, in case of the ship breaking up, the work of clearing her was pushed on with all speed, and in ten days, with our own resources, we succeeded in removing everything from the ship, with the exception of the boilers and lower masts and bowsprit, the weight removed amounting to 204 tons 17 cwt.

I would here remark that the vessel by the above was lightened as follows:—Draught of water, leaving Chefoo, 9 ft. 6 in. forward, 10 ft. 7 in. aft; on floating, 7 ft. 2 in. forward, 6 ft. 6 in. aft.

The beach on which the ship was stranded being exposed to north-east gales, and it having been found impossible to heave her off without digging the shingle away round the stern, the following plan was resorted to for protection.

A breakwater, built of bags filled with shingle was commenced, and placed round the ship, as shown in Fig. 2. The bags, being filled and sewn up, were placed, the lower tier about twelve deep and reducing to six at the water's edge; when completed it was intended to dig away the shingle to about two feet below the low-water mark, resting the vessel on spars placed twelve feet apart, which would form a rrigiron in case any temporary repairs were required (as shown in same plan. If necessary, the inside of the bag-wall would have been coated with clay in order to keep out the water, and a well dug in the rear of the dock to drain and pump the water into.



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The above scheme was commenced under the impression that the high tides were over for the winter, and that the vessel would be obliged to remain on shore until the spring.

The breakwater was pushed on with all speed, coolies and our own men working night and day, with parties from "Charybdis" and "Lapwing," and working in the water with temperature below freezing. In ten days it had advanced from the stern as far as the first dotted line in Fig. 2. The digging having at the same time commenced, the greater portion of the vessel's stern and quarters were clear of shingle to low-water mark, when an extraordinary high tide gave so much water that I deemed it advisable to try once more to heave the ship off; this was successfully done after about three hours' hard work.

I may mention that two days before coming off, and when the breakwater was abreast the foremast, a north-east blow was experienced, which, raising a heavy sea, proved its efficiency, as the bags kept the whole force of the seas from the ship; and although the blow lasted twelve hours, no material damage was done to the breakwater.<sup>1</sup>

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#### NOTES ON THE REMOVAL OF THE HULL OF THE SHIP "FOREST,"<sup>2</sup> BY EXTEMPORE TORPEDOES.

By Lieut. JOHN FERRIS, R.N.

THE circumstances under which the hull of the "Forest" came into the positions I have endeavoured to show by the diagrams, are doubtless familiar to all, and in my paper I will endeavour to explain the means that were employed by the Channel Squadron at Portland to remove so dangerous an obstacle to navigation.

The wreck was aground on her stem or bowsprit in 24 fathoms of water, bottom upwards, stern-post well out of water, keel at an angle of 45°.

Fig. I represents the general appearance of the wreck on Wednesday, September 19th, when three oil casks, each containing 270 lbs. of powder, were slung on an iron span and placed in such a manner that one exploded on each bilge and one on her keel, as in Fig. II. These mines were at the greatest depth it was possible to

<sup>1</sup> The temperature during the 25 days the ship was on shore, as extracted from the log, ranged during the day from 27° to 50°; wind generally from the northward, with snow occasionally. The working parties from the "Frolic" and "Mosquito," and latterly from the "Charybdis," as shown by the notations in the ship's log, were of great service, and the latter were, with the working party of the "Lapwing," much exposed while making the breakwater; they had to be taken out of the water when quite exhausted and resuscitated by hot tea, kept in readiness on the beach.—A.P.R.

<sup>2</sup> The "Forest" was a full-rigged ship, strongly-built of timber, of 1,422 tons.

place them, at, viz., 10 fathoms, as the pressure of water would have caused them to collapse at a greater depth.

These mines were so far effective that they broke the keel and burst in large portions of the bilges. It may be asked, why were not these mines and others placed on the deck or under-side of the wreck? but this is easily explained, as, on account of the masts, yards, rigging, &c., any attempt at a contact on that side would have been futile.

An extempore mine of 250 lbs. of gun-cotton was then placed in position at 20 fathoms, but the strength of the tide prevented this mine from making a good contact with the wreck, the effect, therefore, was apparently small.

Four (100 lb. cases) mines in fork were then placed in the hole made in the morning, as in Fig. III, and exploded at a depth of 17 fathoms. The effect of these mines was very considerable, as very large portions of wreckage continued to come to the surface for several minutes afterwards.

On this day the sea was rough and the tides were strong; this prevented our using our means to the best advantage.

*Thursday, September 20th.*—Two gun-cotton mines failed to explode, as the strength of the tide caused the wires to break by fouling the wreck.

Four (300 lb.) extempore mines on a span were then exploded at a depth of 18 fathoms, and we were rewarded by large portions of the fore-part of the ship coming to the surface, also seamen's chests, bedding, &c., which showed that we were working in the right place to destroy the lower part of the vessel.

Five more mines of 200 lbs. each were then exploded as fast as they could be prepared, and proved highly useful. The tides and weather this day were more favourable than on the preceding one.

*Friday, September 21st.*—A hole was bored through the dead-wood close to the stern-post and a chain strap rove through it, so as to shackle on a steel hawser with which she was to be towed when free.

The Trinity yacht "Galatea" endeavoured to move the wreck, as also did Her Majesty's ship "Defence." On failing to move it satisfactorily, we again attacked it at 2 P.M., with a succession of extempore mines, and by nightfall had reduced the wreck to the state (as in Fig. IV) of being in three large parts; the bow remaining downwards because of chain cables, &c.

*Saturday, September 22nd.*—Two more explosions brought the masts and yards to the surface and completely freed the wreck from the bottom, when she was towed into Portland Harbour.

These notes are offered for the Journal of the Institution, in the hope that they may counteract those misinformations (ignorantly written) which filled the daily papers at the time of the first explosions at the wreck.



Fig. 2.

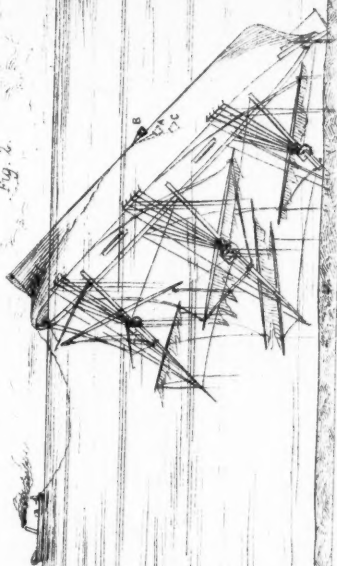


Fig. 4.

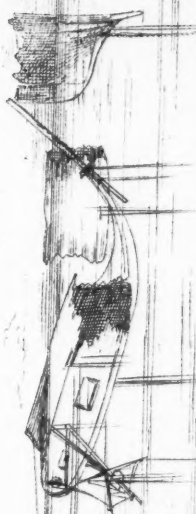
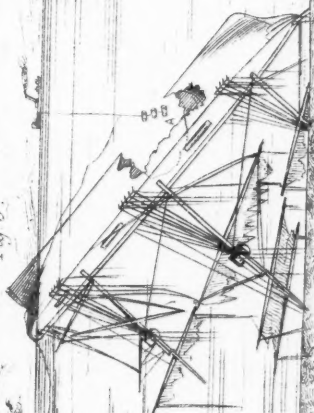
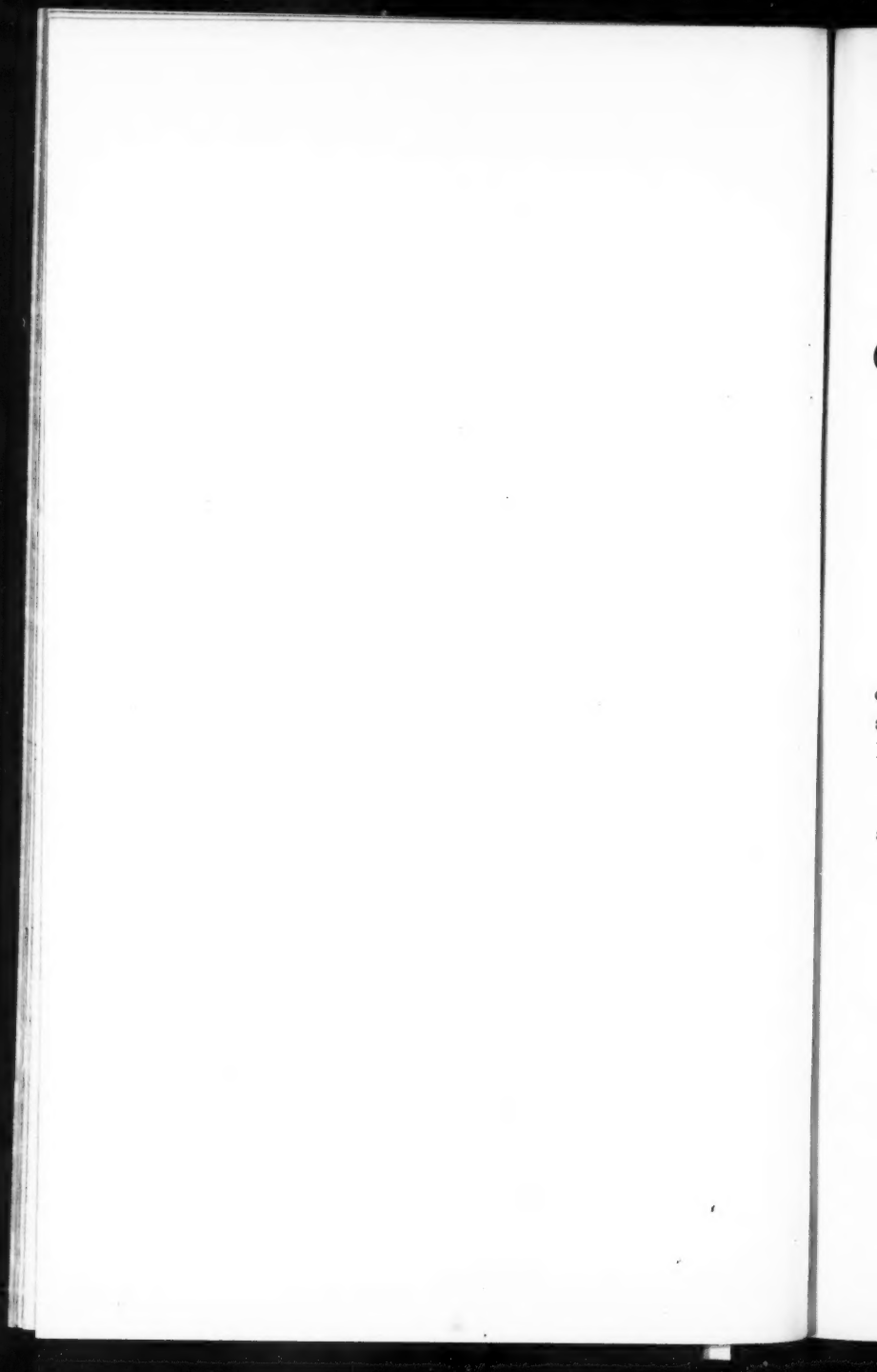


Fig. 1.



Fig. 3.





# OCCASIONAL PAPERS, NOTES,

AND

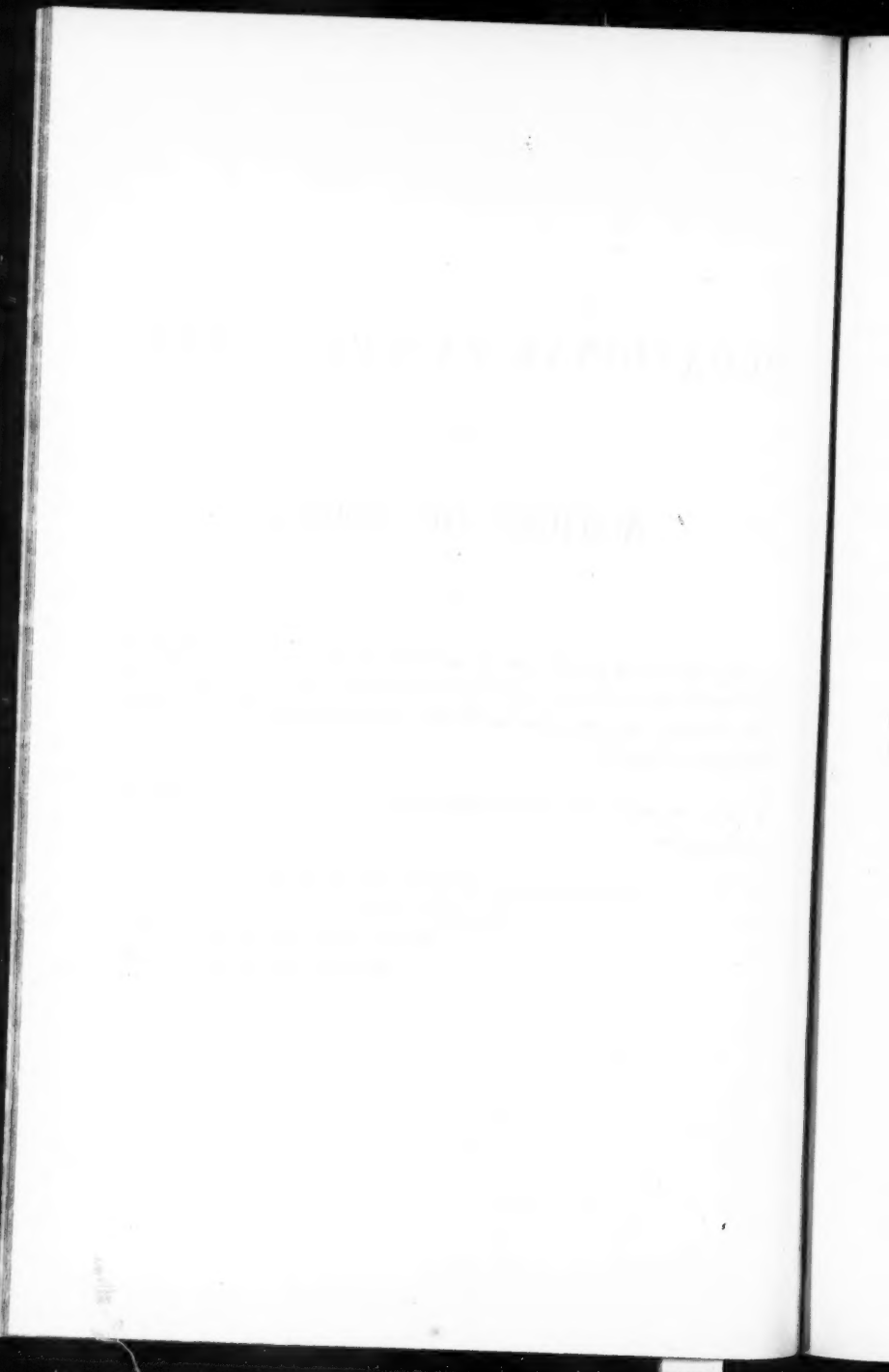
## NOTICES OF BOOKS.

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It is requested that communications, or books for review, may be addressed to

LIEUT.-COLONEL LONSDALE A. HALE,  
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Royal United Service Institution,  
Whitehall Yard, London, S.W.



# ESTIMATES FOR THE GERMAN NAVY FOR THE FINANCIAL YEAR 1877—8.

Translated and abridged from the Austrian naval periodical *Mittheilungen aus dem Gebiete des Seewesens* (Vol. V, Nos. 9 and 10), by Cyprian A. G. BRIDGE, Captain R.N.

## Pay of the Imperial German Navy.

	1877-8.	Last year.	Increase.
	£	£	£
Total fixed expenses.....	1,114,230	1,053,424	60,806
Total special expenses.....	1,284,611	729,300	555,311
Grand total.....	£2,398,841	£1,782,724	£616,117

THE following details extracted from the full account of the above may be interesting:—

Admiralty :					£
Chief of the Admiralty .. .. .	..	..	..	..	1,800
Reporting Councillor .. .. .	..	..	..	..	495—375
Assistant Councillor .. .. .	..	..	..	..	300—240
Naval Officers :					
Vice-Admiral .. .. .	..	..	..	..	660
Rear-Admiral .. .. .	..	..	..	..	495
Captain.. .. .	..	..	..	..	420
Commander .. .. .	..	..	..	..	315
Captain Lieutenant, 1st Class .. .. .	..	..	..	..	225
"    "    2nd " .. .. .	..	..	..	..	156
Lieutenant .. .. .	..	..	..	..	75
Sub-Lieutenant .. .. .	..	..	..	..	60
Marine Battalion :					
Colonel on the Staff .. .. .	..	..	..	..	365
Captain, 1st Class .. .. .	..	..	..	..	210
"    2nd " .. .. .	..	..	..	..	138
First Lieutenant .. .. .	..	..	..	..	69
Second " .. .. .	..	..	..	..	60
Marine Artillery :					
Captain.. .. .	..	..	..	..	156
Lieutenant .. .. .	..	..	..	..	} 120
Torpedo Lieutenant .. .. .	..	..	..	..	
Chaplain's Department :					
Protestant Chaplain .. .. .	..	..	..	..	120 to 165
Roman Catholic Chaplain .. .. .	..	..	..	..	150

Medical Officers :						£
Surgeon-General	..	..	..	..	..	300 to 420
Chief Staff Surgeon	..	..	..	..	..	210 to 270
Staff Surgeon	..	..	..	..	..	138
Assistant-Surgeon	..	..	..	..	..	60 to 69
						(sea-service and seniority to be added to this).
Engineer Department :						
Director	..	..	..	..	..	300 to 360
Chief Engineer	..	..	..	..	..	300
Engineer	..	..	..	..	..	225
Sub-Engineer	..	..	..	..	..	180
Chief Machinist, P. Officer	..	..	..	..	..	£97 10s.
Machinist	..	..	..	..	..	£75

*Note.*—Afloat all Officers receive from Government a large mess contribution, so that they live practically free of expense. On shore all Officers receive house allowance. There is no "half pay" in the English sense.—C. A. G. B.

*Fitting out of Ships.*—1 main-decked corvette for the West Indies; 2 gun vessels for the Mediterranean; 3 main-decked corvettes; 2 flush-decked corvettes, 3 gunboats for Eastern Asia (China and Japan).

*Practice Ships.*—4 ironclads, 1 despatch vessel, forming a squadron; 1 sailing frigate for cadets; 2 brigs and 2 flush-decked corvettes for boys (1 for 6 months, 1 for 12 months); 1 gunnery ship with a gunboat as tender, 2 torpedo vessels; 2 vessels for instruction of engineers (one each a month).

*For Service and Communication between the Naval Ports.*—2 despatch vessels; 2 gunboats (for surveying); 2 ironclads with reduced crews; 1 transport; the yacht "Grille," 3 months).

*Establishment of the Seamen-gunner Companies.*—The sea-artillery division, which at present consists of 3 companies, is dissolved, and 4 seamen-gunner companies (*matrosen-artillerie-compagnien*) formed instead, of these 2 are stationed both at Friedrichsort and Wilhelmshaven. The Officers of these companies will be Officers of the Navy, and include 1 Commander, 2 Captain-Lieutenants 1st class, 2 ditto 2nd class, 4 Lieutenants, and 2 Sub-Lieutenants.

*Torpedo Affairs.*—At Friedrichsort (Kiel) and Wilhelmshaven sea-mining, and torpedo-dépôts are established, each administered by half of the entire torpedo staff.

The *personnel* of one such dépôt consists of:—

- 2 Torpedo-Lieutenants.
- 1 Chief-Torpedoist (P. O. 1st class).
- 2 Torpedoists (P.O.S. 2nd class).
- 1 Chief Torpedo-man (*Maat*).
- 1 Torpedo-man.

For Friedrichsort there is in addition 1 Torpedo Engineer for special service of the fish-torpedoes, who has the rank of engineer (*maschinen-ingénieur*) and is placed on the list for promotion of that rank.

Besides, there is one electrician assigned to the torpedo department, who has the rank of a chief engineer.

In addition to this *personnel* there is also a Torpedo Experimental

Committee composed as follows:—2 Commanders, 1 Captain-Lieutenant, 1 Lieutenant, and 1 Captain and 1 Lieutenant of Engineers.

Lastly, there is formed at the Admiralty under the presidency of the Director himself—a Rear-Admiral—the bureau of torpedo and harbour defence which is formed of a Commander and a scientific chemist.

*Ship-building for the German Navy.*—(*"Mittheilungen,"* Vol. V, p. 478).—In the year 1873, the German Admiralty published a naval programme which was to be completed in 1882. At this moment the German Naval force was to be brought up to the following strength:—

- 8 Ironclad frigates (sea-going fighting ships).
- 6 Ironclad corvettes (fighting ships for offensive coast defence).
- 7 Coast defence vessels (monitors).
- 2 Floating batteries.
- 20 Unarmoured corvettes.
- 6 Despatch vessels and yachts.
- 18 Gunboats.
- 2 Training ships.
- 3 Sailing brigs.
- 28 Torpedo vessels.

The proposed number of fighting ships is already in existence; the lately launched ships on the above list are nearly completed, and are in course of being fitted.

Of the 6 armoured corvettes, the first, the "Hansa," has now been ready some years. Four others are building, and the construction of the sixth is just about to be begun. Of the four unfinished, the first, the "Sachsen," was launched at Stettin, on July 21st of the present year. The second, called the "Baier," was to be launched at the end of September of this year and be finished in the spring of 1879. The two, as yet un-named, armoured corvettes, "C" and "D," are nearly beyond the first stage of construction, and ought to be launched by the end of 1879; whilst the armoured corvette "E" is about to be begun.

Of the coast-defence vessels comprised in the design of the "naval programme," already two—the "Arminius" and "Prinz Adalbert" are now considered obsolete. Five ironclad gunboats are already afloat, viz., "Wespe," launched July 6th, 1876; "Viper," September 21st, 1876; "Biene," December 2nd, 1876; "Mücke," May 5th, 1877; "Scorpion," May 19th, 1877. Of these the "Wespe" is already completed, the remainder will be completed for service in the course of this year. In addition to these there are at present two similar ironclad gunboats, provisionally designated "F" and "G," building by the Weser Company, at Bremen.

The number of unarmoured corvettes now ready amounts to 12. Besides these is the corvette "Leipzig," nearly ready. She made her first trial trip on May 6th of this year. A second corvette of this description, named the "Sedan," was launched at Stettin, on June 17th, last year and is to be ready this autumn. Their armament consists of two 17 c.m. (6·7 in.) revolving guns on deck, and ten 17 c.m. (6·7 in.) guns on the broadside; these are made by Krupp.



The revolving guns can fire directly ahead and astern, and this fire can be increased by that of the foremost and after broadside guns in the same directions.

Two other decked corvettes, the "Bismarck," and the "C," are being built by the North German Ship-building Company at Gaarden, near Kiel. These will be 244 feet in length; beam 45 feet, with  $18\frac{1}{2}$  feet draught; displacement 2,800 tons. The iron hull is covered with teak-plank and sheathed with zinc. The indicated horse-power is to be 2,856, and the speed 15 knots. The screws can be hoisted up and the ships will be full rigged frigates. The armament consists of sixteen 15 c.m. (5'8 in.) Krupp guns, of which fourteen will be mounted on the broadside, and two as chase guns. The "Bismarck" was launched on July 25th of this year: the "C" was to have been launched at the end of August.

Two other corvettes of this class are to replace the "Arcona" and "Gazelle," lately struck off the list of the Navy; they are being built at the Vulcan yard, at Danzig, and are to be launched in October. The above named four corvettes of this class are to be completed in the autumn of next year (1878).

Also this year there will be two more corvettes of this class commenced, one as a substitute for "Hertha," to be removed from the list, and the other, provisionally designated "D," as an increase to the present establishment.

The Yacht "Hohenzollern" launched at Gaarden, near Kiel, on July 5th, 1876, is now completed. Besides her, there are two other despatch vessels, designated "B" and "C," in course of construction since 1876; the building of a third, designated "D," will be begun this year. The despatch vessel "B" will not be launched this year.

To replace the gunboat "Blitz," removed from the list, a gunboat, called the "Otter," was built at Elbing, which was launched on June 7th, 1877. She is of special design for the East-Asiatic station and has a removable keel, so as to be able to pursue pirates up rivers. In place of the "Tiger" and "Scorpion," to be taken off the list, and the "Delphin," there are also three new gunboats begun to be built this year.

Finally, there is one more torpedo vessel, designated provisionally "C," in course of construction.

[The following notes translated from the same journal will prove interesting.—C. A. G. B.]

THE RUSSIAN TORPEDO VESSEL "WZRIW" (explosion).—The torpedo vessel, "Wzriw," for discharging Whitehead torpedoes, built by Baird, at St. Petersburg, and launched on August 13th, is a screw vessel 120 feet long, 16 feet beam, drawing  $7\frac{1}{2}$  feet forward and 10 feet aft. By terms of the contract, the engines are to indicate 800 horse-power. The keel abaft is curved downwards as in the Thornycroft boats, to allow of the employment of the largest screw possible. The quarters of the crew are sheathed with  $\frac{1}{4}$ -inch sheets of Muntz metal, and the bulwarks with steel plates. The tube for discharge of the torpedoes is in three pieces, and is carried in the fore part of the

vessel in the line of the keel. The engines have two low-pressure, and one high-pressure cylinders. The crank shafts and the screw-shaft are of steel. The vessel is to go 17 knots.

There are two boilers, tubular on the locomotive system, with blast-pipes; in order to obtain the greatest draught possible, a ventilator is erected in the furnace. The fire places are of steel plate. The tubes likewise are of steel. The "feed" is not worked through Kingston valves, but through simple cocks, which are in connection with the injection. The coal supply amounts to 24 hours at 17 knots, and 4 days at 10 knots. The cost at 17 knots' speed will be not less than 100,000 *roubles*; at a speed less than 17 but more than 12 knots, 90,000 *roubles*, less than 12 knots, 77,000 *roubles*.

[The *rouble* varies; its value here may perhaps be taken at rather more than two shillings.—C.A.G.B.]

THE SWEDISH TORPEDO VESSEL "RAN."—The Swedish torpedo vessel "Ran," like the gunboats, for using Whitehead torpedoes, is an unarmoured vessel. The "Ran" has been built at the engine works at Bergsund, near Stockholm, and was launched on July 19th last. Her dimensions (Swedish measurement) are: extreme length, 188·5 feet, ditto at the water-line, 170·75 feet, beam, 26·67 feet; draught of water, 9·75 feet; displacement, 625 tons. The engines have two screws and are to develop 960 horse-power, and drive the vessel at a speed of 13 knots: the coal supply is estimated at 80 hours. The vessel is rigged with two masts; and has a sail-area of 2,800 square feet. At the bow, 5·2 feet below the load water-line, the discharging tube is fixed. Ordinarily she will carry 8 Whitehead torpedoes, but there is space for 12. The armament consists of one 4·1 inch rifled gun, and 4 mitrailleuses. The crew is to number 65 men. Provisions for 2 months, and water for 25 days are carried. The hull is divided into seven (*sic*) compartments by five bulkheads; and in addition, at the bow, a water-tight chamber of plate iron is fixed. The cost when complete and ready for sea is estimated at 450,000 Swedish crowns.

## TABULAR STATEMENT OF THE TORPEDO ARMAMENT OF VARIOUS NAVIES.

Translated from a paper of Sub-Lieutenant (Linienschiffs-Fähnrich) C. POTT, Austrian Navy (*Mittheilungen aus dem Gebiete des See-wesens*, vol. v, Nos. 9 and 10, 1877), by CYPRIAN A. G. BRIDGE, Captain R.N.

Description of Ship.	Name.	Displacement, tons.	Indicated H.P.	Speed.	Remarks.
		ENGLAND.			
Torpedo school ship .....	"Vernon" .....	2,388	379	9.4	Discharges fish-torpedoes under water.
Torpedo vessel .....	"Vesuvius" .....	260	350	19.4	Discharges fish-torpedoes above water.
Thornycroft boat .....	"Lightning" .....	..	..	..	..
Torpedo vessel .....	"Sartorius" .....	..	..	..	..
		FRANCE.			
Thornycroft boats .....	(2 boats) .....	..	..	18.0	Carry pole-torpedoes under water.
" " .....	(6 " ) .....	..	Building	18.0	For pole- and fish-torpedoes.
		RUSSIA.			
Torpedo vessel .....	"Wzriw" .....	..	800	17	Discharges fish-torpedoes.
Thornycroft boats .....	(6 boats) .....	..	..	17	By Baird, Kreiton, and Thornycroft.
" " .....	(20 " ) .....	..	Building	..	..
		GERMANY.			
Torpedo vessel .....	"Zieten" .....	873	2,350	16.0	Discharges fish-torpedoes under water.
" " .....	"Ulan" .....	364	800	..	Carries pole-torpedoes (to be fitted for discharging fish-torpedoes under water).
" " .....	"Rival" .....	129	250	..	..
" " .....	C .....	..	Building	..	..

Description of Ship.	Name.	Displacement, tons.	Indicated H.P.	Speed.	Remarks.
GERMANY—continued.					
Vessels for laying mines	Nos. 1, 2, and 3	24.4	60	7.5	Carried previously pole-torpedoes.
" "	Nos. 4, 5, and 6	34.4	80	7.5	" "
Prahm for laying mines	" Basilisk "	30.4			
" "	" Pfeil "	219			
Torpedo school ship	" Elbe "				
Thornycroft boat	" ? "	..	..	..	Proposed for 1882, 28 boats.
ITALY.					
Torpedo vessel	" Pietro Urica "	535	1,400	18	Discharges fish-torpedoes under water.
" "	" Sebastiano Verrier "	230	520	..	Building.
" "	" Andrea Promana "	230	520	..	" "
Thornycroft boats	(2 boats)	..	250	18	Building. Discharge fish-torpedoes above water.
HOLLAND.					
Instruction vessel	" Vulkan "				
" "	Gunboat No. 7.				
Thornycroft boats	Nos. 1, 2, and 3	..	250	18	Carry pole-torpedoes.
DENMARK.					
Steamer for laying mines	" Quintus "				
Thornycroft boats	Nos. 1 and 2.	..	100	15.6	Carry towing-torpedoes.
Steam launches	Nos. 1 and 5.				

Description of Ship.	Name.	Displacement, tons.	Indicated H.P.	Speed.	Remarks.
Torpedo vessel .....	"Ran" .....	625	960	13.0	Discharges fish-torpedoes from the bow under water. Launched July 19th. Building at Stockholm.
" .....	"A" .....	..	..	..	} Carry pole-torpedoes. Carries towing-torpedoes. Carry pole-torpedoes.
Torpedo school ship .....	"Vanadis" .....	..	..	..	
Torpedo practice ship .....	Monitor "Loke" .....	1,600	150 nom.	8.0	
" .....	Gunboat "Blenda" .....	600	160 "	..	
" .....	" .....	..	..	..	
Thornycroft boat .....	No. 1. ....	..	..	14.9	} Carry pole-torpedoes. Carries towing-torpedoes. Carry pole-torpedoes.
" .....	Nos. 2 and 3 .....	..	..	18.0	
Thornycroft boats .....	Nos. 1 and 2 .....	GREECE. Building		17.0	Carry pole-torpedoes.
Torpedo vessel .....	"Alarm" .....	UNITED STATES. 700		15	Carries pole-torpedoes.
" .....	"Intrepid" .....	330		..	Discharges fish-torpedoes under water.
" .....	"Spuyten Duyvil" .....	116		..	Carries pole-torpedoes.
" .....	"Nina" .....	306		17	Discharges fish-torpedoes under water.
Thornycroft boats .....	Several (Lay) p	torpedo-boats that can be steered		..	from the shore.
Thornycroft boat .....	No. 1. ....	ARGENTINE REPUBLIC. ..		12.5	}
" .....	No. 2. ....	Building		..	
Thornycroft boat .....	No. 1. ....	BRAZIL. Building		..	

HYDROGRAPHICAL NOTES MADE BY LIEUTENANT G. GIORELLO, OF THE ITALIAN NAVY, ON A VOYAGE FROM HONG-KONG TO YOKOHAMA, IN THE MONTH OF JUNE, 1877.—(*Rivista Marittima*, October, 1877.)

Translated by CYPRIAN A. G. BRIDGE, Captain R.N.

At 8 o'clock on the morning of June 23rd we left the port of Victoria in Hong-Kong, and proceeded by the Tathoung Channel (eastern passage).

The appearance of the weather was favourable, and the barometer had for thirty hours stood steadily at 758 (29·84 inches), after having been during the preceding 19th and 20th between 753 and 755 (29·64 inches and 29·72 inches). Just outside the passage we encountered light winds from the southward, and a long swell from the north-east.<sup>1</sup> We proceeded at the rate of nine knots. As we stood away from the land we headed for the Formosa Channel, shaping a course that would carry us to the westward of the shoals in the southern part of the channel, and bring us so as to sight the Island of Formosa in its north-western part. In the night between the 23rd and 24th the wind shifted from the south towards the east, and then remained variable between north-east and north-west, winds which we experienced during the whole of the 24th. The swell at the same time had changed to one from north-east and north-west, as we proceeded farther to the northward. On the morning of the 25th the south-west monsoon set in. We were in sight of Paksa Point in Formosa at day-break. At this moment we began to experience a current direct from north-west to south-east, which set us towards the coast, and obliged us to shape course more towards the north-west. We found that, in proportion as we neared the north of the island, the stream ran always with greater strength towards the south-east. The English chart, No. 2,412, notes at the exit from the channel the counter, or cold, current from the north-east to the south-west, with the direction, "the surface current sets according to the monsoon." Being then in the season of the south-west monsoon, we had every reason to expect that we should not encounter a current, or at least have it in our favour, that is to say, that the surface water should run from the south-west towards the north-east. This is the first discrepancy that we observed on the present voyage between our own observations and those given in the charts and sailing directions (*portolani*). We must note that, until we were close to Formosa, that is, until about 6 o'clock

<sup>1</sup> In translating, the compass equivalents as given in *Spanish* in Captain Bedford's "Pocket-book" have been used. The *Italian* equivalents given by him are apparently not those of the Government navy, but of the merchant service.

on the morning of the 25th, no current exerted any influence on our position, so that we arrived in sight of Paksa Point at the time and at the distance estimated. We have said that the current always sets with greater strength towards the south-east. We found that the spot at which we most felt its influence was in the latitude of Agincourt Island, at which point the current ran with a velocity of about 3.5 knots an hour. From that time it rapidly decreased in strength until the evening, and at 26° of latitude completely disappeared. We argued from this, that the water which flows from the Yellow Sea into the China Sea, after having run as though coasting the main land, instead of always inclosing itself in the Formosa Strait, turns sometimes to the northward of that island, and flows against the Meaco Sima group, whilst only a small quantity of water reaches the Formosa Strait; but still this does not follow the line of the China coast, but approaches the west coast of Formosa instead.

From noon on the 25th until the same time on the 26th, between the two positions, 25° 30' N., 121° 45' E. (of Greenwich), and 27° 25' N., 124° 50' E., with the wind south-south-east, we had to note no "set," although, to believe the indications on the chart, we were already in the region of the Kuro-Siwo, or Japanese current. At 5 o'clock in the evening of the 26th we sounded, and taking advantage of the circumstance, we tried the temperature of the water at 11 fathoms (20 m.) and 27 fathoms (50 m.) depth. At 11 fathoms we found a temperature of 80° F. (26° 5' C.); and at 27 fathoms one of 74° 30' F. (23° 6' C.); which gave the remarkable difference of 3° 30'. The evident conclusion from this was, that we were within the limits in which the water coming from the south runs towards Japan, whilst at a depth of 27 fathoms (50 m.) we reached either the stationary water or a counter-current coming from the north. From that point at noon on the following day, the 27th, we learnt that in 24 hours we had been carried by a current of little less than one knot an hour direct towards the east-north-east.

On the same day, the 27th, beginning at daylight in the morning, we carried out, at a distance of ten miles apart, a series of soundings, which, with the spots at which they were carried out, will be found noted in the *Meteorological Log* (*sic*) of the ship. We were not able to sound over a greater distance than 60 miles, since at the 70th it was not possible, with the means at our disposal, to feel sure that the sounding-line reached the bottom or not. From an inspection of the layer of tallow put on as "arming," we could suppose that the weight had touched, but we could not tell the moment at which it happened on account of the immense curve in the line that sagged towards the stern, although the ship was perfectly stationary. A weight of about 2 cwt. (50 kilos.) was used, attached to a common line paid out by hand. There was reason to suppose that a lower counter-current added to the causes that rendered the working so difficult. After various attempts that succeeded badly, the work was suspended, which it was hoped that we might have completed, so as to mark on the chart in these latitudes, and in a direct line towards Van Diemen, a series of soundings.



As the wind continued to blow fresher from the south-east, the sea became heavier, and the barometer exhibited a tendency to fall. At 3 P.M. we sighted the islet of Dundas, belonging to the Linschoten Islands. On account of the mistiness that came on, it was perceived that we should arrive in Van Diemen's Straits at night, when the light could not be seen, nor the islands which bar this passage towards the west be recognized, and it was decided to pass between Naka Sima and Suwo Sima.

We hardly had begun to get amongst the islands, when a very strong current, of at least three miles an hour, set as from the west towards the east. Beyond the islands we headed towards the north-east. At daybreak on the 28th we saw that in 24 hours we had been set to the east-north-east 43 miles. Course was altered to sight and pass within ten miles of Siwo Nis-aki; but taking into account the current marked on the English chart, No. 2,347, we kept a half a point more to port, and with all that did not arrive in sight of the land; whilst from daybreak till noon on the 29th, it was seen that we were set free 40 miles from W. by S.  $\frac{1}{2}$  S. to E. by N.  $\frac{1}{2}$  N., instead of S.W. by W. to N.E. by E., which convinced us that the current in this place does not always exactly follow the coast, as would appear from the chart. Taking into account this current which we had experienced, we shaped course to sight during the night the light on Rock Island, and also to get in a short time within the range of the light from the other lighthouse on Cape Iroo-Saki.

From 2 to 4 P.M. the ship was tried under sail with the wind from the south-west, force 4, and sea rather heavy. From 5 to 6 we fired at a target, under steam, making at the same time observations on the rolling of the ship at different speeds. At 5 in the evening, before beginning to fire, the position of the ship was ascertained by observation, and at the beginning of the night we got an exact latitude.

We were thus under most favourable conditions for making the land. About 2 in the morning of the 30th, we ought to have seen the light, from which we should then shape course for Vries Id. and the Uraga Channel. Not having, at 3 o'clock, seen the light, and being overtaken by a thick fog, it was thought we might have come too much to the southward, and then, to avoid the dangers presented by Redfield Rocks, we steered north-north-west for about an hour and a half (until it was light) at half speed. It was just light when we headed towards the north-north-east, and then north-east, so that on that course we might leave Rock Island on our left, and make Vries, or one of the islands that run from Vries to Fatsizio almost from north to south. This manœuvre was caused by our seeking to lose as little time as possible in making the land. The fog continued very thick, and there were all the appearances of our being near the land from the thickness seen ahead. We proceeded slowly, and when it cleared for a moment nearly ahead, but a little on the port bow, were seen breakers and a rock. We could not make it out clearly, but manœuvring, on the supposition either of our being near Cape Iroo Saki or Rock Island, we first steered south-east, and afterwards east and north-east. Thus we sighted Rock Island, which we made out well

from the lighthouse situated in the centre of it. It was then evident that we had made the land near Cape Iroo Saki, and the current had then set us towards the north-east instead of towards the east by north, as we had experienced early in the day, and with three-quarters of a mile velocity, instead of two and a-half to three miles, as given in the charts.

At daylight we sighted, a little to the northward of us, an American vessel, steering the same course as ourselves. She had the wind astern, and might have been making from seven to eight knots an hour. Continuing on, we left her astern about a mile, when we saw the breakers. On then altering course to starboard, we made a signal that she was running into danger, so that she could haul up on the starboard tack in time to get clear of the shore, as we then shaped course east, and afterwards we saw that she followed our motions and was coming after us. In the latitude of Rock Island we lost sight of her, on account of the fog. When the above ship, the "Charter Oak," of Seaport, arrived in port, we learnt from the Captain that he, from the same causes which led us to believe we were steering a proper course, had been confident about his proceeding, and had run direct for Vries; but our sudden manœuvre having been observed, and a signal, which he could not distinguish on account of the fog, being seen, he had thought there was some danger, and had followed our movements. The breakers he did not see until some minutes after.

Course was shaped for Vries and then for Uraga Channel. Having passed Vries, the fog began to lift, and at noon had completely cleared, and we were able to fix our successive positions by bearings. At 4 P.M. on the same day, the 30th, we reached the anchorage at Yokohama. From the observations which we have been explaining in relating the history of this passage, we may conclude that the Kuro-Siwo current is generally met a few miles to the northward of Formosa, sometimes it does not begin to make itself felt until much farther, and that its force is very variable, and is so within limits much more extensive than those assigned by the chart, since we experienced it up to 20 miles on one day and 43 miles on another. The waters of the Kuro-Siwo flow into the Pacific from the basin of the Tung-Hai or Eastern Sea, acquiring greater velocity when on their way between the Linschoten Islands and between those islands and that of Nipon, and thence they rather set *from* the coast of Japan than follow it. The current which had set us to the northward in the night between the 29th and 30th, may be rather taken to be a sea-current falling into the Gulfs of Owari and Suruga.

From information obtained, we had, to corroborate this assertion, many opinions of captains of ships-of-war at present at Yokohama. All say that, from Van Diemen's Straits to that port, running along the coast, they have not observed the currents marked on the charts. The same assurance was received from the "Sunda," of the Peninsular and Oriental Company, which makes periodical voyages between Hong-Kong and Yokohama. The Captain of the "Tibre," which makes the same voyage in the service of the *Messageries Maritimes*, assured us of the same fact, saying, that in the nineteen times that he

had made the voyage between the two places in this vessel (that is at almost all seasons of the year), he could state that he always encountered relative differences in the strength of the Kuro-Siwo, and that in nearly half of his passages from Siwo-Misaki to Iroo-Saki he had not experienced any current, or had found it insignificant. The same captain, moreover, added, and this agrees with our own statements, that the currents sometimes observed in this part of the sea may be attributed to the tide, since at times the set is also towards the south-east, a direction quite at variance (to the extent of about 90°) with that given and noted on the charts.

We have spoken of all this at length, in order to notify that in the passage between Hong-Kong and Yokohama it is necessary not to trust too much to the direction and force of the current as given on the charts. It often happens that thick fogs come on, and frequently, for several days together, it is not possible to count upon the assistance of astronomical observations. To count, therefore, in making a landfall upon a current equal to that found 200 miles farther to the south-west, would, in the majority of cases, lead to a grave error.

With reference to the navigation of this part of these seas, it results, from much information obtained, that, as a rule, all prefer the passage of Van Diemen's Straits; but the captain of the "Tibre" asserts that it has many times happened to him (and he ought by this time to be well acquainted with the locality) to have to heave-to during the night, and that perhaps, the fog continuing, he was not able to make out the islands at the mouth of the strait, and did not see the light. The captain of another *Messageries* mail steamer almost always preferred the passage between the two islands of the Linschoten group, or passed between the more southerly of these and Oho Sima. And this latter is the passage chosen also by the Peninsular and Oriental steamer "Sunda," when the weather is thick, or threatens to become so. The passage chosen by us between Naka Sima and Sawa Sima may often be an advantageous one; still it is little used, because imperfectly surveyed, though there is reason to believe that it is perfectly clear, as the sailing directions suppose, and as it appeared to us, for we did not see any obstacle, though a long sea from the south-east would certainly have shown us the breakers or other signs of shoal water, in case of the existence of shoals in mid-channel.

(Signed) G. GIORELLO, *Lieutenant.*

"Cristoforo Colombo," Yokohama,  
15th July, 1877.

## ALGERIAN WARFARE.

By Major J. NORTH CREALOCK, 95th Regt., D.A.Q.M.G.,

### PART I.

AMONG the many valuable papers published in the "Journal des Sciences Militaires," those by M. Villot on Algerian warfare will be found by English officers both interesting and instructive.

His articles on this subject in the numbers for May, June, and July, 1876, form in fact a text-book for minor operations against a half civilized race, together with the data necessary for the administrative services in the field; in the opening chapter we find republished a short but clear description of Algeria, topographical and statistical, written by the same pen.

The views that find expression in these numbers have a peculiar value to English soldiers, telling, as they do, of the experience of those who have conquered and held, during some 27 years, a country difficult for military operations, and where every adult male is a soldier. To those who have seen service in Africa, India, and elsewhere, this clearly expressed statement of the conditions of Algerian warfare, and necessary precautions in carrying it on, may seem more real than the theoretical and somewhat nebulous treatises we have been favoured with by others. The duties of the English Officer, in the past certainly, have been more akin to these here referred to, than to those traced in theoretical discussions, such as the advantages the attack or defence possess in the present day; the study of such works undoubtedly forms a necessary part of the education of an officer, representing as they do the experience gained on a wider field, and written by men of high intellectual attainments, yet such a course of study should be supplemented by studying the practical details of the duties connected with the daily life in camp, on the line of march, and on outpost: in all of which the troops of France have had such constant experience; and it must be conceded, that the more conversant our officers are with such practical details, the better able they will be to take charge of the large number of reserve men and young soldiers they may be called on to command in future wars. It has often been remarked, that the system, now inaugurated, of raising a peace establishment to that for war, will test to the utmost the capabilities and experience of our officers and non-commissioned officers on taking the field; in peace time, the constant strain on their energies, that is inevitable, with the drilling recruits and rapidly passing them to the reserve, will certainly be relaxed by such studies.

The value of minor operations has been recognized in our camps of instruction of late years, and a grateful release from the necessary

but tiring duties of the parade-ground has been found in such exercises. It is to be hoped that the system will be more developed, and greater facilities obtained, than exist in most of our stations, inasmuch that by the regulations now to be found in the Field Exercise, we find that such a system, even down to companies, is expected to be followed.

M. Villot disclaims any intention of discussing the larger operations of war, or of any that do not bear on Algerian warfare. He commences the discussion of his subject by laying down the three principal elements to be considered in the art of war—the nature of the country, the races inhabiting it, their arms—to which may be added their organization for war. He then proceeds to investigate Algeria from each of those points of view. Unlike Macarthy, Behagel, and others, M. Villot divides Algeria into three distinct regions—the Tell, in the north; the Sahara, in the south; and the “Hauts Plateaux,” or Steppes, between them.

Following his description, and that of others, we find “the Tell” to be a mountainous and broken country bordering the Mediterranean, the whole extent of Algeria, varying in width from 70 miles at the west and centre to 160 miles to the east, and containing 45,000,000 of acres. It is generally highly cultivated, and the granary of Algeria. This zone presents the most varied aspects—vast plains, alternated by long valleys, and mountains varying from 3,000 to 7,000 feet in height; the slopes of the latter are here covered with forests or shrubs;—there they are barren, and elsewhere have large portions cultivated; they are also intersected with innumerable watercourses. The peculiarity of the plains is, that their undulating surface is broken by long and broad ravines, totally invisible except in their immediate neighbourhood.

The climate of the Tell is as variable as its aspect; on the most elevated parts frost and snow remain during five months of the year; while from May to October, the hot season, the mean temperature varies from 67° to 70°, and 80° in August. The heat is tempered by sea breezes, and the nights cool during the latter end of July; by the end of September, however, the Sirocco wind may be expected; luckily its duration does not average more than three days at a time, but while it lasts the thermometer may rise to 110° in the shade; man and beast feel its effects, and even vegetable life seems suspended.

M. Villot points out that the isolation of portions of the population, the system of small farming, and the difficulty of road communication, is the result of this diversity in the climate and the nature of the country.

Between the Tell and the Sahara lies the region of Steppes, or “Hauts Plateaux,” stretching from the frontier of Tunis to that of Morocco, consisting of immense plains, to the extent of 29,000,000 acres, covered with stunted shrub and alfa grass.

Here the water finds no egress to the Mediterranean, but finds its level in large salt lakes called “Chott” or “Sebkhra.” The River Chelif is an exception, and traverses both the level country of this zone and the mountainous region of the coast.

M. Villot considers that the climate here resembles that of France except that the rainfall is neither as regular nor as frequent. Snow is often seen, but does not lie; the summer heats are great, rising to 100° in the shade, but the nights are cool; according to other authorities great changes of temperature in the same day are noticeable, which they consider explains the constant use by the natives of woollen garments, and their distaste for European costume.

Following Macarthy's description, we find "it is only beyond this zone of transition, which lies between the richness and the poverty of nature, that the true Sahara is found; the country of sterility, the region of oases, comprising 100,000,000 acres."

The great Atlas chain, stretching from Cape Bon in Tunis to the Atlantic, a distance of 1,500 miles, separate these steppes from the "Sahara."

The character of this range is that common to the sierras of Spain and the mountains of Africa; it is broken up into a series of groups, formed of parallel links, between which lie plains of great fertility, such as the Hodna (termed sub-region of Hauts Plateaux).

In the lowest portions of these plains the mountain streams collect, and finding no egress, form salt lakes, and disappear in evaporation: in these basins, hardly above the sea level, are found the heat and dryness of the Sahara, combined with the herbaceous vegetation of the Tell.

The Sahara is an ancient bed of the sea, very varied in its aspect to the eastward, but to the west stretch immense desert table lands, broken by extensive lower lying sandy wastes.

M. Villot combats, however, the general idea that sand is a sign of sterility; being cooler than the surrounding atmosphere it retains for a foot or more in depth a certain coolness by which the roots of vegetation benefit, a view which is borne out when we remember many tracts in the north of Rajpâtana.

Rain in the Sahara is rare, indeed in certain spots it is unknown for years together.

In winter this region is thickly covered with a grass, salt to the taste, but a favourite food with animals.

The races that inhabit Algeria are the Kabyles and Arabs of the Tell and the Steppes, and the wandering and sedentary tribes of the Sahara. The Kabyles or Berberes are to be met with in nearly all parts of northern Africa; they are described by Behagel as the aboriginal race; they are Mahomedans, of a fine physique, with blue eyes, hair generally red, and a fair complexion. The Kabyle is patriotic, courageous, sober, and inured to fatigue, but from a military point of view undisciplined and unable to carry out a concerted plan; still, a race whose every male is a soldier from boyhood and acquainted with every yard of a difficult country, is no enemy to be despised. M. Villot points out, that they never defend a position except when forced to do so, in which case they intrench themselves with considerable skill. Their usual method of warfare is to retire when pressed, separating only to reappear on the flanks, and harass the rear-guard; they frequently make night attacks.



They do not care for a wandering life, those on the mountains occupy themselves in their village gardens or as small traders; in the plains, in agriculture and tending their flocks, while those in the Steppes engage in commerce, some however find a livelihood in escorting travellers, pillaging caravans, and fighting their Arab and negro neighbours. Their costume in war is simple enough, being but a leather apron.

The Arabs of the Tell are the cavalry of the country; their tactics consist in avoiding direct engagements and in endeavouring to attack detachments, convoys, and rear-guards; their mode of attack is extended order; their costume is the haïk and burnous. The wandering Arab tribes make excellent infantry, and their horsemen are equally valuable, being enterprising and skilful; and this is to be expected when we remember that the nomad Arab is from his childhood under discipline, and, being ever on the march, is used to its attendant organization and mobility.

These nomad tribes are the most dangerous portion of the native population—always ready for insurrection, and equally ready to rob friend or foe. The sedentary Arab tribes of the Sahara inhabit the oases, they are townsmen, enervated by the climate and brutalised by slavery and isolation; they are good marksmen, but are only formidable behind the walls of their villages.

There are other elements in the population, such as the Kouloughlis, Negroes, Jews, and so-called Moors, but these are of no importance in the consideration of the subject before us.

The arms of the Kabyles are long flint fire-arms of small bore, pistols of like make, clubs, and long daggers.

Among the Arabs, the firelock is of a shorter and lighter make and easily managed by a horseman, they also use a long pistol and a straight sword with a very confined hilt.

The arms of the Nomad on foot are a club and an inferior gun, but in addition they are extremely expert in hurling stones.

The fire-arms of the inhabitants of the oases resemble those of the Kabyles.

The natives are fully aware of the inferiority of their arms as compared with those of the French, and do their utmost to remedy it, and though the improvement of late years is noticeable, yet generally their arms may be said to be much as they were twenty-five years ago.

Such is the general character of the country, its tribes and their arms.

In the country of the Kabyles no assistance to the commissariat of an invading column can be counted on. No sooner does a column appear than the flocks are driven off and concealed in tortuous ravines.

In their villages vegetables and oil may be found, however.

In the Arab districts the flocks are likewise driven away at the first sign of danger and the grain buried.

Under these circumstances and that, owing to the absence of roads, no wheeled transport can be used, it is easy to understand that the chief anxiety of a commander must be to make efficient commissariat



and transport arrangements, the details of which must depend on the organization of a column. M. Villot, therefore, next discusses what should be the special organization of columns destined to operate in Kabylia, and those for the plains (Tell or Sahara).

#### *Organization of Columns for Kabylia.*

Experience has proved that the organization of columns in Kabylia must be governed by two principles:—1, that they should be strong: 2, and that they should converge.

A column should muster at least 4,000 fighting men, and if possible be formed of men used to the work. The appearance of a force which is weak in numbers or physique, and deficient in marching powers or ill-provided (details that are easily appreciated) is but an incitement for revolt rather than for submission; but not until it is far distant from its base of operations, not until some considerable geographical obstacle is passed, do the natives show their hostility, then no repose is granted to it, day and night constant attacks are made—the history of Algerian warfare tells of such columns having been often decimated or destroyed.

M. Villot considers that the march of a column, *acting singly*, has been found useless, except when it is dispatched with a distinct object such as the revictualling a post—the enemy disappears as it advances—the only method, and one that we have found in India to be equally applicable, is that of a series of converging columns, resulting in the surrounding the enemy; he further states that in dealing with such an intractable race their fruit trees must be destroyed, their villages burnt, and such stringent measures should be persisted in until pardon for the past is asked and hostages for the future given.

Although forming a part of a series of converging columns, the strength of each column *should be such as to make it respected*, for in such an operation it may become isolated far to the front, by other columns having failed to move equally fast, or else have to bear the brunt of the whole force of the enemy, in their endeavours to break through the cordon closing round them.

Such expeditions should never return until the success obtained is beyond question, but this success is only obtainable by the leaders of the various columns carrying out their orders with the utmost exactitude and complete negation of all personal feeling. African warfare can show many instances of strategical combinations carried out with precision and success worthy of a more extended theatre.

#### *The Composition of a Column.*

The composition of a column should contain all the elements of an army corps, inasmuch that it must be self-subsisting. It should therefore comprehend infantry, cavalry, artillery, engineers, and the administrative services as follows: an ambulance train, provisions, stores, cattle, a strong detachment of military train, and means for organizing auxiliary transport. As elsewhere, the infantry is the principal arm, and its organization, equipment, boots, and *morale* should be

carefully watched by the commander from the moment the column is constituted.

In Kabylia, as the country is unsuited for its action, only small detachments of cavalry are necessary, the moral effect of this arm is however so great that  $\frac{1}{20}$ th of the combatant force is thus composed; they are chiefly used as escorts, couriers, &c.; to a column consisting of 4,000 infantry, one squadron of Chasseurs d'Afrique and one of Spahis<sup>1</sup> are attached.

One section (3 guns) of mountain artillery suffices for a column of the above strength, the guns are carried on mules if necessary, but can also travel on wheels.

The artillery train<sup>2</sup> carries 100 rounds per gun, consisting of common shrapnel shell, grape, and rockets, and fifty rounds per rifle, the ammunition-box holds 9 rounds, that for the infantry 2,000 rounds; therefore such a column requires 35 artillery caissons and 100 for infantry.

As one mule carries 2 boxes, about 70 mules are required for the park in addition to those for the guns and spare, say in all 90 mules.

The engineers generally consist of a half section under an officer, in addition to the one attached to the staff: attached are mules for the transport of tools sufficient for a whole battalion to be employed at once.

## PART II.

*Marches.*—Every march in Algeria should be conducted as if in presence of an enemy, with precautions against attack from any quarter, and in such formation as to enable *all* arms to take the offensive if necessary.

The normal order of route is an advanced guard of infantry without packs, followed by a detachment of sappers, the main body, a rear-guard (also without packs), with a certain number of mules with cacolets; then the convoy protected by companies echeloned on its flanks. In the convoy the artillery leads, followed by the ambulance column, the administrative department, officers' baggage, led horses, and spare mules.

The length of march in a mountainous (and hostile) country should not exceed 15 miles, especially in the early days of an expedition. The start should be made as early as possible, but not before surrounding objects can be distinguished.

Previous to the *veille*, one prolonged note on the bugle warns the cooks to prepare coffee, and the stable-guards and muleteers to feed their animals: all this should be done without noise, but we know from our Indian camp life how difficult it is to ensure quiet in such a

<sup>1</sup> The Chasseurs d'Afrique are recruited as other regiments in France; they are mounted on Arab horses: natives are not allowed to enlist. The Spahis are native cavalry with a proportion of French officers and men: an interesting account of the latter force will be found in the "Militair Wochenblatt," No. 91, 1875, and "Journal Militaire Officiel," 1874, page 3.

<sup>2</sup> Vide "Armed Strength of France," compiled in the Intelligence Branch, Quartermaster-General's Department.

case. Half an hour after *reveillé* the "boot and saddle" is sounded and the mules loaded. This is likewise the signal for regimental quartermasters to parade those men whose packs are to be carried or who are unable to march (they have been previously noted at the medical inspection the preceding evening). After a second medical inspection, they are marched to the ambulance.

Half an hour later the "assembly" is sounded, when the troops form up and the regimental quartermasters collect the companies' mules, and conduct them in silence and order to the convoy. They are accompanied by the *bâtmens* of Officers. These men are armed and carry their packs. The convoy is formed under the orders of the Quartermaster-General, who always has under his orders a certain number of horsemen selected from the squadrons of *spahis* and *chasseurs*. In special cases a selected Officer takes charge of the convoy when formed, together with the escort.

The order of route for the column is laid down the previous day, and should be arranged so as to insure that the duties of advanced and rear-guards and flanking parties are taken in turn by each portion of the column.

No detachment told off for any such duties should ever be permitted to be unaccompanied by at least two *cacolets*.

The rule is to sound the halt after 40 minutes' marching by night and 50 minutes by day.

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The tactical disposition of the troops when marching most frequently adopted in Kabylia is fully explained.

It has been found impracticable to flank the column by a line of men in extended order, owing to the excessive reliefs necessary, and the depth of the ravines to be crossed. This is evident when we remember that a column of 4,000 men would extend 3,000 yards, as the 1,200 mules would generally have to move in single file.

M. Villot takes first the case of a *line of march running along a series of hill crests* (or a line of water parting). In explaining this, he assists the reader and himself by a sketch of such ground. The road in such a case would naturally wind round the hill-tops, thus leaving on a flank positions commanding the road, which, if occupied by an enemy, would bar further advance. The column would be thus formed; advanced guard without packs, accompanied by its *cacolets*, and a detachment of sappers,—four battalions,—the convoy with four demi-sections distributed here and there in its length,—two battalions,—rear-guard without packs and its *cacolets*.

On the column reaching that portion of the road near the first hill-crest, the leading (No. 1) battalion should diverge (say) to the left, take up a position on the hill-crest to protect the flank or flanks. The remainder of the column continues to advance. On approaching the next hill (say to the right) No. 2 battalion (or half of it) should be detailed to protect that flank, while the remaining half-battalion might, if the ground necessitated it, be pushed on to the rising ground next in advance.

The convoy and rear-guard having passed, No. 1 battalion rejoins the column.

The second case is *to pass from one valley to another across a hill*. The procedure is simply to form up and collect the whole column on the rising ground, including the last sections of the rear-guard, previous to descending the second valley.

The third case, *to pass a defile*. The main body of the column should not be permitted to enter a defile until its further end and the surrounding heights are occupied.

Fourthly. *To traverse low ground from one hill crest to another*. Often in such a case a stream runs through the low ground, which would then probably be wooded.

Many a column in such a position has had to withstand attacks in front and rear, and it undoubtedly presents a difficult problem, for on the rear-guard leaving the hill, the enemy would occupy it, and fire on the rear-guard company below it. If disorder ensued, a fresh enemy would certainly appear on the up-stream flank, and dispute the passage of the stream, while in their direct front a hostile fire would be directed.

The most prudent course, it has been found, is for a strong rear-guard, say a battalion, to occupy the crest in rear and positions on either flank. The column should proceed as follows: cavalry and advanced guard without packs, first and second battalions, convoy and artillery, third battalion in position on the right, fourth battalion on the left, fifth battalion in rear of the convoy, sixth battalion with one company without packs deployed in position, facing the rear.

The cavalry and advanced guard will pass the stream; search the ground beyond, and if the enemy is met, drive him off to such a distance as to save the column from their fire while descending to the river.

No. 1 battalion of the column having in its turn crossed the river, will seize the position *up* stream, which otherwise would certainly be occupied by the enemy. This will cover the passage on that flank.

No. 2 battalion should after crossing watch the ground in the same manner *down* stream.

In the meantime the convoy is assembled near the stream and crosses with as much regularity as possible. Having crossed, it is again formed up, but is not permitted to move off until all arrangements are completed.

If the stream is strong, it is necessary to post well-mounted troopers up stream to break its force, and also down stream to assist the awkward ones who lose their footing.

The battalion acting as a rear-guard will commence its retreat from the ridge as soon as the convoy has approached the stream. The method of conducting this retreat must depend on the configuration of the ground.

If in echelon, the movement should always commence by the echelon on the *lower* ground, the others retiring and *re-forming* on it successively; the echelon on the *highest* ground must be the last to retire. Any troops that are halted and in position on the flanks will rejoin

the rear of the column as the line of echelons reaches them. The following is also noteworthy:—It is preferable generally for troops thus fighting as a rear-guard to move in formed bodies rather than in extended order, as the men are more in hand, retain their *morale* better, but their closer formation should not prevent every advantage being taken of accidents of ground.

As the Kabyles generally display their greatest vigour in attacking a rear-guard, it is advisable to detail for the duty the most reliable troops, for on their discipline depends the safety of the column.

There is no doubt the drill instruction of infantry in retreat is a very important matter, and one that has not been as much discussed, for many natural reasons, as the formations for attack.

It must, however, be remembered that the mode of retreat here referred to is the simplest of the three cases which ordinarily occur.

One being the retreat after an unsuccessful attack, in which case some mixing of commands would have previously taken place, and confusion would consequently exist. The second case (in which category that referred to in the text comes), the careful arrangement of separate units for alternate or successive withdrawal from a position only meant to be temporarily held; the third case being the retreat necessitated by an unsuccessful defence, and being conducted in close proximity with an advancing enemy.

It is beyond the scope of this paper to refer to or discuss infantry formations, other than those mentioned by the author; but it may not be out of place to recall what appears to be generally accepted as the points to be reconciled in retirement formations.

(a.) The resistance of the force covering the retreat should be as powerful as possible.

(b.) That the fractions of this force should retire under the protection of the remainder halted.

(c.) That the men should be kept under their own Commanders, and not be permitted to mix up with other commands.

(d.) That the conformation of the ground must regulate and modify the drill instructions.

If such considerations are to bind our movements, we find the following general result:—

1. That the distance to which one portion of the covering force should retire should be limited to the next position, whence it can give efficient protection to the other. We may say therefore that, unless the ground recommends a greater distance, 100 to 200 yards should be the limit.

2. The fractions of the line should be kept intact, under their own Commanders; therefore, in the case of two companies having become intermixed in the fighting line, it is advisable to retire one and close it somewhat on the march, leaving the other facing the enemy.

On the remaining companies in the fighting line retiring, they must also be closed to a flank (if they had been before intermixed), and not pass through the halted companies, as, by doing so, they cloud the front of those who should be covering their retirement.

3. The whole line should re-form on its halted parts, *previous to a*

*further retirement*; whether the same portions that retired first should be next retired would depend on the nature of the ground occupied by the different fractions; but, as a rule, it would be obviously unwise to leave the same companies to bear the brunt the whole time.

To return to the author. The march of the rear-guard should at first be slow. When the Commander of the column (who should now be with the rear-guard) sees the convoy has crossed the river, he will hasten the retreat.

The march of the column will then be resumed by the advance guard, followed by the third, fourth, and fifth battalions, who will cover successively any rising ground that may present itself, as before explained. The convoy and the cavalry will follow next.

The first and second battalions having thus protected the passage of the convoy will rejoin the column, No. 2 battalion relieving No. 6 of the duties of rear-guard. The sketch illustrating this movement represents ground where, in 1856, a battalion and a half were annihilated in consequence of not having taken the above precautions.

No doubt such an exercise, carefully carried out, first as a drill, then as a manœuvre, has often been practised at our tactical stations. There can be no doubt of its importance.

5. *Marching along Low Ground.*—The word “mamelonner” was used in the text, under the former case, and again here. It represents what Marshal Bugeaud impressed on those under him as being of vital importance for a column marching alone in Kabylia, viz., the covering of rising ground on either flank by the advance guard, which, after the passage of the column, rejoins as a rear-guard, a new advance guard having been, in the meantime, thrown out, and so on in succession. Supposing two battalions of a column being told off for this duty, they would, as a rule, assure the ground on either flank for about a mile.

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It does not seem necessary to refer to the order of march in the south, beyond that the cavalry (except when in the presence of an enemy) may be at a distance on a flank; but mounted men should always hover round the column. Cavalry has, of course, in the open country of the south an importance denied to it in the mountainous districts.

Infantry must make frequent halts to allow the convoy to come up, for the camel, which in these districts is the usual beast of burthen, cannot march as fast as the troops.

The frequent attempts to form expeditionary forces of cavalry alone have never met with success. The writer's view and our experience in India is the same, that in a camel corps lies the best means for such operations in the plains.

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The orders for troops on the line of march do not differ from our own, except that on the bugle sound “halt,” men fix bayonets, form on the guides, and pile arms, without further word of command; they



fall in and step off in the same manner. When more than one battalion, however, is marching, their bugles do not repeat the call until each has closed to the correct distance. In hilly districts arms are not held, and the usual regulations in other details cannot be complied with.

When the "grande halte" takes place, the convoy closes up, and the troops halt around it.

Marching in the months of July, August, and September is to be avoided.

Men are advised not to drink on the march; they should be satisfied with rinsing out their mouths, to which we may add, a blade of grass held between the lips is a great preventative against thirst.

The recommendations for marching generally are familiar to all who have served in India; though perhaps the precaution of shading the eyes against moonlight, when marching, is not fully recognized by us, nor is the habit of bathing the eyes after a hot, dusty march, understood to be provocative of ophthalmia.

Snake bites are not uncommon, and each company should be provided with a bottle of alkali to cauterise the bite; all grass for bedding should be thoroughly beaten and sifted as a precaution against them.

In an enemy's country no bugle-sounds on the march are permitted; otherwise the tedium of the route may be enlivened from time to time by the regimental bugles.

In the region of the oases, and encamped near one, no natives, more especially women, should ever be permitted to enter the lines, for sanitary reasons.

*Bivouacs.*—The procedure differs in no wise from our own, though it must be allowed it is not often practised by our battalions.

In Algeria both the bivouac and camp is always formed as a square, in a defensible position (near water, wood, and forage).

At least one company is told off as a special guard for the Commander, and it encamps near him; this acts as a reserve under his orders in case of attack, and in case of panic or confusion it has often proved of the greatest value.

In Kabylia the cavalry is placed in the centre.

In the south and plains this is impossible, owing to the large proportion of this arm; it then forms the least exposed face.

General Yousouf recommends that infantry should be placed in support of each flank.

In the Tell this is an excellent precaution; but in the south, as night attacks are of rare occurrence, it is not so necessary.

*A Camp near a Stream.*—The camp should have one face parallel to the watercourse, infantry up stream, cavalry next below it; lower again, at a fixed spot, the men can bathe and wash their linen; such precautions are always necessary in such a case; if the stream is scanty, three dams should be made.

*In the case of a Spring.*—The camp should be so arranged that the spring may be situated between the quarter-guards and the camp. The infantry are supplied with water first.



*In the case of Wells.*—Men are not allowed to approach the wells themselves. If the wells are Artesian, dams are made at certain spots according to the outflow, otherwise the water is drawn by natives (under the surveillance of a guard) by means of skins, which are emptied in barrels; the "Administration" then distributes it.

The "redirs" are large depressions in the rock, acting as reservoirs for the rain water; these sheets of water often extend 15 or 16 acres, with an average depth of one foot; as long as the mud at the bottom is not disturbed the water obtained is very fresh and highly aerated. Muddy water can be cleared by several means, the simplest being by placing a piece of alum in it (*vide* also "Wolseley," page 38).

*Forage.*—Forage is scarce in the Sahara, and even in the table lands. It is frequently necessary to halt the cavalry on the line of march for foraging purposes.

The direction, in a strategical sense, of columns, depends on the necessity of encamping near water, forage, and fuel; but the enemy experiences the same wants, and the close of a campaign has often been brought about by anticipating the use of wells, springs, and "redirs."

Copious extracts are quoted, borrowed from the pamphlet published by General Bataille, regarding the details of camp life.

The method advocated for picketing a horse by one fetlock, with his head loose, is not generally approved of by us, probably from the experience of those of us who have lived in India. The following advice might be noted with advantage, perhaps :—The faces of a camp should be, as far as possible, in a straight line; but, to insure this, tents should neither be placed in unhealthy spots, nor where much labour is necessary to clear the ground; therefore, this regularity should only be attempted when it can be *easily* obtained; the *first* desideratum being the comfort of the men, and that they should be able to rest.

Officers are advised to live and mess together by companies, as companies are often isolated.

On the march, the soldiers' soup is made by sections; one cook suffices to look after four pots. The coffee is made at the first long halt, and the soldier completes his meal with the portion of the ration they are supposed to have kept for that purpose.

The medical inspection is made every evening, and the ambulance warned of the number of men and knapsacks they have to convey the following day on the march.

Under the head of punishments, we find it recommended to give extra turns of guard over the arms, whereby a man's punishment relieves his comrades.

Space necessitates the passing over much excellent advice, but the concluding paragraph of this chapter cannot be too carefully borne in mind :—"The only repose worth having is that gained at night; therefore after retreat has sounded, any noise, songs, laughter, calls, or moving about from one tent to another, must be strictly forbidden. Horses and mules must be thoroughly secured; any chance of disturbing the quiet of the night should be avoided, and the com-

"mandant should, at the commencement of an expedition, establish the "most severe discipline in these details."

*Convoys.*—The usual system of forwarding supplies from a base, from post to post along a line of communication, to a force at the front, and the return of such to the rear, cannot be followed in Algeria, owing to the smallness of the forces employed and the want of security on the lines of communication. It is found necessary to form strong detachments, consisting of infantry with a few cavalry and some spahis, to conduct the convoy. As a rule, two such detachments are formed, one starting from the dépôt, the other from the column.

*Outposts.*—Under the head of "Grandes Gardes," we find outpost duties in the hilly country and plains discussed. The instructions in the last edition of our Field Exercise now embrace all the points which appear to be most worth attention, and formerly probably novel to some of us, such as the desirability of placing at night the relief of sentries near them, thus furnishing small detached parties, this prevents sentries, especially young soldiers, from needlessly giving alarm. Such parties should conceal their position, and even strengthen their posts with stones, branches, &c. A thicket should either be occupied or given a wide berth. The too frequent use of visiting rounds is deprecated when such a system of detached posts is followed.

An attack by Kabyles on outposts by day is not considered very formidable, owing to the superiority of the firearms of the French troops; in fact, the simplest way to meet such an attack appears to be to call up two or three battalions and attack the enemy yourself: this will prevent the chance of a renewal of the attack by night. Firing by sentries should not be allowed; it is useless except as a signal. Outposts attacked by night should never advance.

The proportion for outposts for the protection of the camp of an expeditionary force is placed at a company for each face.

Such outposts or "Grandes Gardes" are placed, by day (in the plains), about a distance of 1,100 yards from the camp, with sentries 100 yards in advance, often a cordon of cavalry videttes, some 2,000 yards beyond the camp take this duty.

By night the "Grandes Gardes" withdraw until they are about 200 yards from each other, with the detached parties of four men 30 paces to their front.

In the hilly country the position of outposts is generally as follows: they should be sufficiently distant to prevent the enemy's missiles reaching the camp, and they should be so posted as to have a view of the camp in their rear, and the most commanding ground should be occupied.

### PART III.

Up to the present time it may be accepted that the natives, whether Arab or Kabyle, are ignorant of drill and powerless to manœuvre, inasmuch as they will never obey, for more than a few minutes, one will.

They are, moreover, very badly armed; still, they prove formidable enemies.

The Kabyle is individually intelligent, muscular, and agile, thoroughly conversant with the country in which he fights, and with a natural instinct for utilising to the utmost for defence the accidents of ground. These tribes suffer from no impedimenta, so are careless as to their line of retreat being threatened.

An attacking force will find a marksman behind each rock far in advance of the main position, thus necessitating a series of petty attacks and development of force before the real position is reached.

Although they are never to be caught on the line of march themselves, they often attack the troops when marching. They avoid attacking a force in position by day, but will make night attacks on a camp. They thoroughly understand the advantages of flank attacks, especially when troops are tempted to get out of hand in pursuit.

The Arab of the plains is still more difficult to grasp. The advancing troops find only skirmishers who retire; the main body, concealed from their view and out of range, watches, however, every movement, and in the event of signs of weakness or fatigue appearing in their enemy's ranks, swoop down in masses like a storm from the mountains. If the hostile advance be not slackened, their skirmishers are reinforced, their fire is, however, harmless.

The Arab, unlike the Kabyle, has a weak point in common with his civilized enemy, viz.: a convoy, consisting of his tents, cattle, women, children, and treasure. He will place his armed men between it and his enemy. The attacking column should, therefore, never allow itself to be diverted, by pretence of fighting, from a direct advance on this vital spot.

M. Villot here takes occasion to combat the statement frequently launched, of late, on the Army of France, that the qualities of its Officers have become deteriorated by the experience gained in Algerian warfare.

He argues, on the contrary, that in this field have become developed the science of marches, formations for attack and defence, and the habit of relying on the initiative taken by officers commanding relatively small units, and that the conditions of modern warfare, dependent so much on the deadly effect of rapid firing, resemble more and more the engagements in Africa.

It must be conceded that any schooling must be beneficial that tends to develop enterprise, and that, as he points out, the testing practically, in a difficult country, of the theories for directing columns of attack, must prove of great value in operations of larger scale.

Honourable and reasonable as such a defence of his profession is, it must still be remembered that successes gained over such badly armed troops, may mislead officers when opposed to those better armed, as lately so fully shown in Bulgaria and Armenia.

The practice of reconnoitring is strongly advocated, both as a means of gaining information and of distracting the attention of the enemy from the real point of attack; further, that it has proved of service in destroying the foolish confidence of troops who seldom see the enemy,

and of enabling men to learn their own real qualities and impressing them on their enemy; but as to the real point of attack, he considers the information gained by single spies is of more value than that obtained by reconnoitring.

Without pretending to offer rules for larger operations, the writer now proceeds to the study of small operations in Kabylia and the plains. These he divides into—

1. A march in presence of an enemy.
2. Chance engagement.
3. Attack of a position.
4. Retreat from a position.
5. The burning a village.

#### *In Kabylia.*

1. *Marching in the presence of an Enemy.*—Experience in Algerian warfare has proved the necessity of not allowing the convoy to become separated from the column, even in the attack of a position. M. Villot refers to an instance where a young and energetic officer, attempting to carry out an operation in defiance of former experience, met with signal disaster; with but a few days' rations, he attempted, by rapid marching, to surprise the enemy, and, by one blow, end the revolt.

As before remarked, the nature of the country, with its deep and tortuous ravines, render it impossible to attempt to protect the convoy by flankers in extended order, and the only safe system is that explained before as that of Marshal Bugeaud, viz., the occupying the heights in advance and withdrawing the troops from them as they are successively passed by the convoy. The rear-guard must, under no circumstances, permit stragglers to remain behind. The column should reach the halting place by 4 P.M. at the latest.

2. *Chance Engagement.*—This, termed in the text “combat de ren-contre,” is the most frequent form of fighting in Africa. Marshal Bugeaud's advice is—

“Should you find yourself suddenly in presence of the enemy, attack him; in such a case the attacking party has almost always the advantage, while he who hesitates or retires will experience considerable loss.”

This advice however, M. Villot considers, should not be pushed to an extreme, and with an inferior force it would be preferable to halt and make arrangements for defence.

Such an encounter should only arise, as a rule, with an advance or rear-guard on the flanking parties. Officers in command of such detachments should be thoroughly acquainted with the views of the commander of the force. No hesitation should, therefore, appear in their action, whether in the attack or taking up a defensive position pending the arrival of the remainder of the column.

3. *Attack on a Position.*—No position should be attacked in front, if it is possible to turn it; but, with the Kabyles, such advice is often difficult to follow, in which case, flank attacks should be combined with the direct attack. The general directions given by M. Villot are in unison with those laid down for our own troops; the attacking

force is to advance with *élan*, taking advantage of cover, to make short but frequent halts, so as to give breathing time, and recover formation: arrived at the point whence the decisive rush must be made, the signal is given by the bugles sounding the "charge." Should the attack succeed, a pursuit, for a *short distance*, should be ordered.

Flank attacks must conform to the general movement, and the force so attacking must not become separated too far from the main column. The use of the bugle sounds, halt and advance, is strongly urged as a means for *steadying*, so to speak, an attack, and, although foreign to our custom, there appears to be good reasons for this view.

M. Villot closes this section with the weighty advice of Marshal Bugeaud, which may be roughly stated as—"The best manœuvre, whether for a large force or detachment, is to have an objective point given it. The advance on it should be straight and vigorous. Success will depend on the resolution of the Commander, the sound organization and courage of the troops, more than on anything else. The leader of a detachment should receive *precise* instructions as to your object, and the *time* and *means* for execution. Without this he will, when once free from your supervision, be guided by the immediate interests of his own command, rather than those of the force of which he is but a part."

4. *The Withdrawal from a Position*.—Such a movement need not always bear the character of a retreat. The pursuer has, however, all the advantage, whether tactical or moral; this the Kabyle appears thoroughly to realise, and they habitually endeavour by withdrawing before an attacking enemy to tempt him to occupy ground which they know must be subsequently abandoned.

Such a retirement tests the qualities of company Officers, their coolness, energy, and power of rapidly realising the value of ground; are all called into play. The retirement should be conducted as an echelon movement, whether by whole or half companies or sections; whatever the command it should be *unmixed*. The use of numerous small bodies rather than fewer large ones is advocated. A sketch of a hill-side and troops in position very clearly illustrates the operation, but it is simple enough. Say four half-companies cover the retirement of the main body; they are formed in line of half-company columns or deployed. The highest point of the ground should always be occupied by the strongest body, and is invariably the *last* to be abandoned. That on the lowest ground, probably a flank, is the first to be retired. (*Vide ante*.)

The retirement is carried on successively, each body forming on the new alignment and firing when its front is clear. Accidents of ground are, however, more to be considered than correctness of alignment. If an echelon is pressed by the enemy it halts, and reinforcements are sent up from the rear-guard, the commander of which must be always on the alert for this contingency. The leader of a detachment, as before pointed out, must be careful, but rapid in the choice of positions suitable for defence. He must *keep his men well in hand*, supervise the firing, and check any tendency to personal initiative on their part, and last, and not least, in a retrograde movement, bear a cheerful

countenance. Such detailed instructions are not out of place when we remember that it is in such an encounter that the Kabyle displays all his courage, and that it is one he deliberately watches for and plans. Our own Army is neither ignorant of the dangers attending a retreat in the face of an active and cruel enemy, nor the strain on the energies of Officers in such a case. As the Kabyles understand the bugle sounds they should never be used *in a retreat*; but, on the other hand, should an offensive return be found necessary, it should be made with drums beat and bugles sounding. The effect of such a diversion is generally excellent, but it sadly retards the retreat.

It is seldom possible to prepare an ambuscade owing to the vigilance of the native scouts; but its effect, when successful, is very great, as the Kabyle pushes on without any formation that can resist a flank attack.

It but remains to add that the Officer in command of the troops forming a rear-guard should be picked for the duty. This Officer should remain near the rearmost echelon; the leader of the column generally with the companies in support.

5. *Burning a Village.*—Marshal Bugeaud would certainly have been deemed "unspeakable" by modern historians and statesmen of the sentimental school, but as we ourselves have, when the necessity arose, acted somewhat in the spirit of these instructions, we may venture to refer to his views and those of Colonel Laure.

"If," remarks Colonel Laure, "our only weapons against the natives are to be softness and persuasion, we had better give up our difficult conquest. Might is right in the eyes of the natives, and however good a Government may be, it will be despised if it fails in carrying out its behests with irresistible force." The Marshal says, "To reduce the Kabyles their villages and crops must be attacked, their trees cut down, and flocks driven off."

As such are received as axioms in the treatment of the country, it is not surprising that the burning of a village should be treated as much a normal operation as is the time-honoured crossing a bridge in our field exercise.

If a village is held, its attack is considered a delicate manoeuvre, which we can ourselves realise from our own experience of cactus hedges, tortuous lanes, loopholed houses, rocks, &c., &c. The villages, however, are generally on a hill-side, and the attacking force has only to play on it with its guns from a commanding height previous to attacking it on a flank. Front attacks have proved so disastrous that Marshal Randon remarked on them in a general order. From a strategical point of view the natives would be wise to perch their villages on spots where they could not be commanded; but the comfort of everyday life precludes this.

In the case of destroying an unoccupied village, the force should be divided into a covering party and a working party, the latter, however, should carry their rifles slung. The villagers are never far distant, and are watching for an opportunity of vengeance. The troops on such duties should carry cooked provisions and no packs. They must leave camp very early so as not to risk being detained from



returning to their camp after nightfall. The force detailed should consist of at least one battalion, with a half section of artillery, reserve ammunition, mule cacolets, a few mounted men and guides. The return march must be made with every precaution. This section closes with Marshal Bugeaud's remark regarding the evil effect on discipline caused by such duties if slovenly carried out. "Never allow regular troops to play the rôle of partisans, you will not fail to repent it if it happens; and the least evil you may expect will be the swift and total disorganization of that portion of your force."

*Operations in the Plains (the High Table Lands and Sahara).*

The operations in the plains only differ from those in Kabylia from the extreme mobility of the enemy and the longer distances to be traversed. Heavy convoys retard the movements of the troops, the enemy always retires, and the capture of his families, horses, flocks, &c., can alone cause his submission. The Arab of either the Tell or the Table Lands commences a revolt by collecting in some distant and supposed sure refuge. These Arabs may be considered nomads over a restricted area, for they dare not retire to the south for fear of their so-called allies, who, like all-devouring locusts (as they term themselves), would inevitably pillage them. The whereabouts of their family refuge should, therefore, be the first object in operating against them.

After these wanderers of the Tell come those of the Sahara (1st zone). These range from north to south, are extremely mobile, are thoroughly conversant with the whole desert, and can live almost anywhere they find water. But these, too, have their points of weakness—the oases and the k'sours, and certain lines of wells which they dare not leave; moreover, they are forced to return to the Tell from time to time to obtain grain. M. Villot remarks, that to follow them across the desert is not always prudent or possible.

In the first days of a revolt, a vigorous and rapid blow may be attempted, such as have sometimes succeeded; but if whole tribes are really in insurrection, it is wiser to wait for autumn or winter.

Lastly remain the nomads of the (2nd zone) most distant Sahara, whose only worldly wealth are camels, and who never advance further than Touggourth, in the province of Constantine, or Laghouat, in the province of Algiers. It would be sheer folly to attempt to touch these inhabitants of the real desert, whose solitudes, in M. Villot's view, must ever remain unknown to regular troops. The operations are thus divided:—

1. March in presence of an enemy.
2. Chance engagements on the march.
3. Cavalry fight.
4. Foraging.
5. A raid or pursuit of a tribe.

No. 1.—A march in presence of an enemy in these parts is a very unlikely event, and therefore needs no remarks beyond those already made.



No. 2. *Chance Engagements on the March.*—The cavalry, on the presence of the enemy being signalled, will close up to the column, and take its place in the centre of the square formed by the infantry. If the enemy attacks, it is only for the purpose of diverting the march of the column. The flanking parties should suffice to brush them from the line of march; but should their horsemen, supported by infantry, attempt to break through this barrier, the cavalry, *supported by infantry*, may be permitted to charge them. In the event, however, of the enemy's attack being pushed home, the infantry will form small squares, and the column will assume a lozenge shape, the convoy in the centre, and the cavalry, formed on either flank of the latter, will watch for occasions to pass through and attack; the guns on the alert for coming into action. Passing defiles has already been explained.

As these attacks are often but feints, the march must be promptly resumed. Such combats are never dangerous. The fanaticism of the Arab is satisfied by the death of a few Christians; he is easily discouraged, and his resources are meagre; but, on the other hand, should any misfortune have attended the march of the column, and a retreat become necessary, these Arabs, hitherto so timid, will not hesitate to engage in a hand-to-hand fight. The wounded, if left behind, are mutilated, and the pursuit assumes, by day and night, every feature that will try the nerves of the best troops; even the wells are rendered poisonous by the corpses thrown in by the enemy. In such a retreat, guns are of the greatest assistance.

No. 3. *Cavalry Fight.*—M. Villot frankly states that, owing to their inferiority in numbers, and in proportion to their distance from the infantry, the engagements of cavalry seldom prove successful. When distant 500 metres from the column one squadron may attack 1,000 native horsemen, but at double that distance it would be imprudent to engage 500. Their tactics are to weary out the overladen cavalry horses by tempting them to charge; they themselves then disperse, only to assemble anew on their flanks or rear. The views of Colonel Laure are equally applicable to this as other warfare:—"The rôle of cavalry is not usually to prepare an action by causing disorders in the enemy's camp, but to confirm a success, pursue the enemy, and re-establish an engagement."

No. 4. *Foraging.*—"Such expeditions are dangerous, as they give birth to marauding, and tend to squander resources; they cause discipline to become relaxed, and should only be permitted if regular distribution of supplies is impossible;" such is the opinion of Marshal Bugeaud.

In this zone of Algeria forage is very scarce, and it is customary for squadron leaders to have authority to profit by the halts, by filling the forage nets; this saves fatigue on arriving in camp, and the necessity of detailing infantry parties to guard the foraging parties. It is, as a rule, only necessary in Algeria to make such expeditions in the case of a prolonged halt with a large convoy. One party (infantry without packs is to be preferred) should act as a guard, another of cavalry to collect the forage.

5. *A Raid or Pursuit of a Tribe.*—It has been before pointed out that the families, &c., of the Arabs, either in flight or assembled at some point of refuge, are the objects on which the French expeditions (called *razzias*, or raids) should be directed. These should be made by converging columns; a direct pursuit or surprise is seldom successful.

If in flight the insurgents and their families will pass certain spots, favourable for the troops to arrest their march, if headed at one point they will turn to another; here should be found another force. It is, therefore, evident that the necessary combinations require considerable care and foresight. It may occur that the opposing detachment is outnumbered and at some distance from immediate support. The commander in such a case should take up a defensive position; he should limit himself to arresting the enemy's progress and causing disorder in his ranks, but on no account be tempted into attacking him, and thus letting his men out of hand by pillaging, &c. If the insurgents change their line of retreat, and he is strong enough, he may follow and harass them.

On the other hand, if the converging forces are at hand, this commander should at once attack, keeping a portion of his men in reserve; still, he should endeavour to increase the confusion of the convoy, so as to induce them to surrender, rather than seek to gain a success by engaging his whole force, for by this he will give up his defensive position, and the natives are capable, when at bay, of making a very considerable resistance.

In the second case, it is supposed that the combination of converging columns has failed, and an attempt is made to overtake the emigrant tribes by a direct pursuit.

No column accompanied by a convoy can, however, hope to overtake Arabs thus in flight, for although they are hampered by flocks, &c., their pace is marvellously rapid.

A column, however, may by chance cross their line of flight and find itself close on their track, which they will easily discover by the presence of dying animals, &c. The column should be at once divided, and the portion ordered for the pursuit must move as lightly as possible. The cavalry should therefore leave its forage, &c., with the convoy, and one of the two battalions told off for this duty should carry no packs.

The cavalry will move in echelons 300 yards apart; this distance from the infantry will be at once gained at the trot.

The infantry will move in two columns, the battalion without packs leading: they will increase their pace, but no hurry to be permitted.

After gaining these distances the leading cavalry echelon will push on, and scour the country with its scouts. On sighting the rearmost of the enemy's horsemen they will commence to fire, on which the remainder of the cavalry will increase their pace, moving 5 minutes at the trot and 10 minutes at the walk.

Such details may seem trifling, but they must be enforced, for, however desirable it is not to lose the touch of the enemy, it is still more important that your men and horses should be brought up for attack unblown and in good array, and *the supports at hand*.

At a distance of perhaps a mile or so the Arabs will turn and con-

front the pursuers, and by attempting to bring them to an engagement cover the desperate efforts of their main body to escape; but the cavalry must avoid this, and content themselves with skirmishing, and thus gain time for the infantry to come up. The cavalry leader must, moreover, be careful not to be led off the track of the main body by these horsemen, who will be certain to try to mislead him. He will accompany the second echelon, and must resolutely limit his endeavours to keep on the right scent.

If the force with him amounts to 400 or 500 troopers, he may, on viewing the main body of the Arabs, advance on them at a trot, but *not* until his infantry is in sight. Within 500 yards of the enemy he should cover his front with troopers in extended order: these should disable all the beasts of burden they can. When the infantry is within a mile, a party of cavalry will be detached to one flank of the convoy, but a close formation is to be retained by the men.

This will generally arrest the flight and cause the tribe to surrender, but, in the case of resistance, the cavalry must harass them until the infantry can come up, when it should be pushed on so as to head the Arab crowd; they must then use their weapons. The strict rule laid down for such raids is that no man is to be permitted to plunder on his own account, but when native levies accompany the column, this cannot be easily enforced, as they have not joined the pursuit for glory, but plunder.

The infantry commander must remember he is the safeguard of the raiders, and his duty is only to support them.

Night attacks on native camps have been often attempted, but they are perilous, and such is the watchfulness of the native, that it is difficult to carry them out.

Cavalry are generally used on such occasions, and every endeavour is made to deaden the rattling of their arms when in movement. The men are only warned at the moment of leaving camp; they are wakened by the sous-officers. Arrived at their destination, the "douar" is surrounded, and a low-aimed and rapid fire spreads confusion throughout it. Little by little the crouching troops close in, and when all is uproar and terror, seize on the women and children as hostages.

A reserve, under the personal orders of the commander, is a vital necessity in such night attacks. Mounted men drive away the camels and cattle, and thus prevent the enemy carrying off any of their property. The women and children are placed under escort in one part, the men in another. At daybreak the whole are driven off to camp.

Under the head of "Submission" M. Villot remarks that no sort of trust can be placed in the words of Arab or Kabyle. Before any negotiation three things must be insisted on—money, arms, and hostages.

Again, under "Repression," he suggests a mixed tribunal of Officers and European colonists should follow each column in a revolted district, whose sentences should be at once carried out. As he before remarked, the natives only respect force, and their faculty of forget-

fulness is only equalled by the thoughtlessness of his own countrymen.

The writer can recall a leader of public opinion telling him previous to the Abyssinian War that the man who introduced the word *prestige* into the English vocabulary deserved a place in a lunatic asylum; this view is not shared by M. Villot as regards his own country, for he concludes by the remark that it is the duty of Frenchmen to increase the *prestige* of their country by every possible means—remembering this, they should be careful to repress insurrection at once.

In the journals of the Staff Officers employed in our many small wars is to be found much valuable information; matter which, if codified and placed at the disposal of our Officers, would prove full of interest and instruction: at this present moment our troops are on the move in two quarters of the globe, where the administrative arrangements, at least, must be dissimilar.

It is at such times and places that young Officers often find themselves in responsible positions, and called upon to carry on duties for which their previous training may have hardly fitted them.

I venture to think that by studying, when the opportunity offers, the experience of others in what may seem but small matters, such as those dwelt upon so earnestly by M. Villot, these Officers will be able to utilize such chances of personally distinguishing themselves, and materially assist in furthering the good of the service.

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COLONEL (NOW MAJOR-GENERAL) v. VERDY DU VERNOIS' "CAVALRY DIVISION IN CONNECTION WITH  
"THE ARMY."

By CAPTAIN F. CHENEVIX TRENCH, 20th Hussars.

FOR some years previous to the Franco-German campaign it had, more or less openly, been made a sort of reproach to the cavalry that it had not advanced *pari passu* in efficiency with the other arms of the Service, and a general feeling gained ground that, in the face of modern arms of precision, it could never maintain the position of importance that in bygone times it had been wont to hold. There were always, it is true, both in England and elsewhere, sagacious and far-sighted military writers who were eager to rebuke and to point out the fallacy of such assumptions as these, but still no one can deny that such opinions did, to a great extent, hold their ground. Doubtless the experience of the European campaigns of the two decades

<sup>1</sup> "Studien über Truppen-Führung," von v. Verdy du Vernois. "Die Kavallerie-Division im Armee-Verbande." Berlin. 1874.

immediately preceding 1870 (in none of which, as it so chanced, did the cavalry play any very important and decisive rôle) served to confirm and strengthen these views. However this may be, it is merely repeating what is matter of history to say, that in the Franco-German campaign the German cavalry, by the services that it was able to render to its own side, not only completely vindicated the high importance of the cavalry arm, but also showed clearly that, although its action had been greatly curtailed in one direction, this was amply made up for by the greatly extended sphere of action that would in most future campaigns fall to its lot. It was natural, of course, in Germany, where the capacities of each arm of the Service are ever so keenly watched and discussed, that not only the past and actual, but also the future and possible achievements of the cavalry should be keenly discussed, and that writers of repute should study the question of cavalry service in all its varied aspects, and give the world the benefit of their opinions upon it. The result of all this is, that in Germany and elsewhere a good deal has been written of late upon this topic. To those who are at all conversant with it, the name of one writer will readily suggest itself. I refer, of course, to v. Verdy du Vernois, inasmuch as he stands forth as *facile princeps* in the mark which he has made upon this topic. It is not too much to say that he has made himself a European reputation as a writer on the art of handling troops, and it is with his work on cavalry service, entitled "The Cavalry Division in its connection with the Army," that the present paper proposes to deal.

This work is divided into two parts. Both of these parts are devoted to the supposed case of a division of cavalry acting independently, but always with due consideration for, and reference to, the movements of the main army, in whose front it is operating, and from which it is detached.

The object of the work will best be given in the author's own words, as stated in his preface, which runs as follows:—

"The last campaign furnished the cavalry arm with an opportunity of refuting certain prejudices which latterly had prevailed as to its utility. Whatever may have been the skill, however, that it may have displayed on many occasions, all that it was able to effect can only be considered as a *début*, or first effort, in the new rôle which nowadays it is called upon to fulfil. Since the last war, the subject has been seriously studied, but up to the present moment no general agreement has been come to on leading principles. This is an additional motive for those who take an interest in this subject to study it with unflagging zeal." . . . . .

An attentive study of the author's pages will show that it is his object throughout, while giving full instructions as to the minutest details which can ensure the success of every operation, yet to fulfil another and a larger object, viz., to make the text convey teachings which concern organization, strategy, and tactics, in their widest and most comprehensive sense. Before proceeding, however, to examine the contents of the book somewhat in detail, a few words, both as to the terrain in which the author has placed the scene of his imaginary

operations, and also on the method or plan on which he has based his work, will here fitly find a place. I will consider these points in the order in which they are here named.

First as to the terrain. "Instead of moving his cavalry division " on any unused terrain, or even selecting for its operation some " less known portion of the ground traversed by the German Army in " 1870, he deliberately places the scene where every intelligent military man must not only have some knowledge of the actual circumstances that occurred there as being very different from those " narrated, but must be more or less aware that one of the chief " deficiencies shown in the Prussian strategy at the opening of the " campaign of 1870 was the total absence of that division of horse " which in Colonel Verdy's pages is performing feats of activity and " energy in advance of the Crown Prince's Army, as it moved over " the French frontier to encounter MacMahon. This may almost " indeed read for satire. Certainly when we know that poor General " Douay's division, though turned, overwhelmed and isolated in the " dangerous position which MacMahon had assigned to it on the " frontier line, yet managed to get away from its fourfold enemies " with comparatively moderate loss, and was scarcely followed up by " their own cavalry at all; and when we reflect that the more important " action of Woerth, two days later, was brought on as it were by " chance, without the French position being felt by the German " horse, it becomes difficult to avoid the conviction that our author " deems the opportunity too good to be lost of enforcing a practical " lesson on his comrades from recent events in their own history." It will be enough to add that the supposed division is formed at Landau, crosses over the Lauter with proper precautions, and drives in the parties of the French cavalry.

Next as to the plan and method by which General v. Verdy du Vernois seeks to impart instruction, which is somewhat peculiar. Like most thorough and painstaking workmen, the General begins his subject *ab initio*, and follows the course of the campaign day by day. Thus he first details the supposed general situation of the Third German Army on the 29th July, 1870, the date from which the operations are supposed to begin. He then goes on to describe the special situation of the cavalry division attached to the said Army, and the manner in which its three brigades were cantoned and ready to march on the morning of the 29th July. Thus far the author deals only in explanatory details. When these have been fully given the narrative may be said to begin. This narrative opens with the mission or task assigned to the cavalry division. This mission is described, as is natural, under the guise of an official letter addressed from Army Headquarters to the General commanding the cavalry division. The measures taken, and the orders issued consequent upon the receipt of this letter, are then fully and minutely detailed. The time occupied in doing all this brings the narrative up to midnight of the 29th July. Having thus described the events of the day, General v. Verdy du Ver-

<sup>1</sup> See *Saturday Review* of January 23, 1875, p. 125.



nois, under the heading of "Considerations relative to the 29th July," not only discusses the various points connected with the organization and handling of a cavalry division that is destined to act in advance of a main army, but also criticises and comments upon the orders issued and the arrangements made for the following day. It is on this plan that he traces out his supposed course of campaign from day to day, and in his hands, at any rate, the method that he pursues is, to those who will take the trouble to follow him out, very instructive.

It would clearly be impossible, within the limits of a paper like the present, to follow the narrative of events with all the minuteness of detail to which the author adheres. I propose, therefore, on the present occasion to take as an example the first day of which the author treats, viz., the 29th July, and to deal with the points on which he comments somewhat fully. After this has been done, I propose to glance more cursorily at the main points on which, in the operations subsequent to 29th July, the author chiefly dwells.

The narrative, then, may be said to begin with the letter from Army Head-Quarters already referred to. This is here given verbatim under the heading of "Task assigned to the Cavalry Division."

On the evening of the 29th July, the General commanding the cavalry division received at Landau the following despatch from the Commander-in-Chief of the Third German Army:—

"Office of the Head-Quarter Staff of Third Army.

"Army Head-Quarters, Speyer, July 29th, 1870. 8 A.M.

"On the 3rd August the army will be in a fit state to advance towards the south and to assume the offensive with all its available forces. Circumstances at all times allow of these offensive operations being prepared by the cavalry. Consequently, the cavalry will quit its cantonments to-morrow (the 30th July), and will concentrate itself in the environs of Landau, where it will bivouac. It will cross the frontier the next day.

"According to the information that has been received up to the present time, the main body of the hostile army of the south is still at Strasbourg; one division alone may perhaps have been pushed forward as far as Hagenau. Nevertheless, divers movements of troops between Sarreguemines and Bitsch have been observed. It is probable that the 5th corps, or a part of it (which forms the left wing of the main army of the enemy operating towards the Saar), is at present either all or partly in that country. Be this as it may, the enemy up to the present time has given no clue to his designs. It is not possible as yet to divine whether the army of the south will confine itself to the defensive or assume the offensive. In the latter case it can operate against the actual position of our army in concert with the troops who are at Bitsch; but it may possibly also intend to cross the Rhine, in order to enter the Duchy of Baden.

"It is for the cavalry to clear up these doubts and uncertainties. Consequently, the cavalry division will reconnoitre the valley of the Rhine between the river and the mountains; it will endeavour to



"repulse the enemy's scouts, and it will advance till it shall have come into contact with his principal forces, whose movements are to be carefully watched. The division will at the same time carefully watch all the routes which debouch from the mountains into the plain.

"The telegraphic lines will be thrown out of working order; the railways in the enemy's country should only be temporarily rendered unworkable. The 5th and 11th corps d'armées have received orders to push forward as soon as possible strong advanced guards on Weissenbourg and Lauterbourg, upon which the cavalry will fall back in case of necessity. Hence you will put yourself in communication with the head-quarters of these two corps.

"The head-quarters of the army will probably be at Landau on the 1st August. In the absence of unforeseen events, the division will send in reports twice a day, viz., at noon and in the evening.

"(Signed) A.N., Commanding the Third Army."

It will be observed that this letter sums up in general and concise terms the general state of preparation of the Third Army; it summarises what is known of the position and movements of the enemy; it shows the uncertainty that exists as to his possible intentions, and points out the task that devolves upon the cavalry. It will be seen, moreover, that all detailed instructions of any kind are studiously avoided throughout.

As to the manner and method in which the task assigned to the cavalry is to be carried out, that is considered, and rightly so, to be the affair of the General commanding the cavalry division.

The cavalry commander, after having made himself thoroughly acquainted with this letter, sends for his Chief of Staff, who lodges with him in the same hotel. This officer also immediately masters the contents of the letter, and in accordance with the instructions of his General draws up to the necessary divisional order. That order was as follows:—

"1st Cavalry Division, Section I. Journal, No. .

"Office of the Divisional Staff,

"Landau, July 29th, 1870, 8 P.M.

"The brigades will parade to-morrow, the 30th July, at 10 o'clock, at their respective alarm posts, and will encamp on the same spot or in the immediate neighbourhood. There will not, however, in any case, be any alarm sounded.

"The troops will carry with them, on waggons, the rations that they may happen to have with them in cantonments; all men who are not in a fit state to march will be sent to the hospital at Landau. All horses not fit for service will be returned to the remount dépôt of the 5th corps d'armée at X.

"The horse artillery, the commissariat column, and the sanitary detachment will remain in their cantonments, but will hold themselves in readiness to march.

"I wish to speak with the officers commanding brigades, on the

" 30th, at noon, at the head-quarters of the division, where subsequent orders will be issued.

" (Signature), A.

" Lieutenant-General Commanding  
" Cavalry Division.

" To the

" 1st cavalry brigade at Essingen.

" 2nd ditto ditto at Head-quarters.

" 3rd ditto ditto at Offenbach.

" 4th detachment of H.A. at Head-quarters."

" Intimation of this order to be sent to the Intendant of the division  
" at Landau."

The General approves of this order, which was immediately copied in quadruplicate. The mounted orderlies who were to take out the orders have been sent for in the meantime. Two of them take it to the 1st and 3rd brigades respectively, a third is sent to the artillery and to the 2nd brigade, which is at Landau, and was at the same time directed to go and find the Intendant of the division, and to ask him to present himself at once at the General's quarters.

When all the necessary and preliminary orders which it was necessary to issue *in any case* have been sent out, the plan of operations by which the task assigned to the cavalry division may best be carried out has to be devised. Accordingly, the General commanding the division sends for the Prussian Staff map of the country in which the projected operations are to take place, which map, conjointly with his Chief of Staff, he studies most carefully. The principal routes have been coloured, which greatly facilitates reference to them. After these two Officers have consulted together, the General commanding gives expression to his views. The exposition of them is somewhat too long for quotation verbatim, and indeed it would be difficult to follow it without constant reference to the maps published with the book. To those who are so inclined to follow them, they will be found worthy of attentive study. The routes open to the enemy, and the plans of operation that he may possibly adopt, are concisely stated and discussed; the measures that are necessary to meet and counteract each movement that he may adopt, and the *pros* and *cons* of alternative courses of action are nicely balanced and weighed. Finally, a definitive plan is decided upon, and the General of the division charges his Chief of Staff to draw up the necessary orders for carrying this plan into effect on the 31st July. At the same time he points out to him that, in accordance with the manner in which the troops were placed in cantonments, the hussar brigade should form the left column. The General also approves of the suggestion of his subordinate, that a battery should be attached to this brigade, and at the same time he reminds him how necessary it will be to put themselves in communication with the two corps d'armée who are in the front line of their own army. As one of these corps, viz., the 5th, has its head-quarters at Landau, the General resolves to go there the next morning, and confer with the Officer commanding it. With regard to the other corps, viz.,

the 11th, it was arranged that the Chief of the Staff should go to its head-quarters at Germersheim. He can get there easily by the railway, and see the General the next morning. Meantime, the Intendant of the division has arrived. The order from the head-quarters of the army is shown to him, and he is informed that orders have been issued to the brigade to parade the next day, in order to take up their bivouacs at their respective posts, and that the troops had been directed to carry with them, on their waggons, the rations that they had with them in cantonments. The Intendant is then asked for how many days is the rationing of the division assured. In reply, he points out that there are only at present two days' rations in cantonments, and that, as a ration will be expended the day following (*i.e.*, the 30th July), the division will only have one day's ration in hand. It was necessary, therefore, to issue instructions that, during the morning of the morrow, rations for three days should be drawn from the magazine at Landau, and laden on the waggons of the provision column. This would ensure, in addition to the reserve ration, two days' rations in hand to the troops.

Finally the Intendant asked the General that directions might be issued to the troops to form all waggons that were obtained by requisition into brigade columns, *i.e.*, a column for each brigade, and that a "zug" or squadron division should be told off for the maintenance of order and for their escort. These waggons should remain attached to the division until replaced by fresh carriages taken by requisition in the enemy's country.

The General commanding charged the Intendant to draw up an order to that effect, and dismissed him, as well as his Chief of Staff. It was now some minutes past eleven.

Before retiring to rest, however, the Chief of Staff has something more to do. He deems it advisable to draw up at once, while the General's instructions are fresh in his mind, the order for the advance on the 31st July. He therefore sits down and commits them to paper. Meanwhile the orderlies that were sent out have returned with receipts for the due delivery of the orders entrusted to them. Finally the Chief of Staff takes the diary and makes in it the following entry:—

"Landau, July 29th, 1870.—Received at 7 P.M. the order from "army head-quarters, directing that the division should be assembled "on the following morning, to take up its bivouac in the vicinity of "Landau, and be ready to cross the frontier on the 31st July. The "task assigned to the division is to gain touch of the enemy, and to "watch his movements. The latter, with the main body of his forces, "is said to be in the neighbourhood of Strasbourg, with one division "at Hagenau, whilst other troops are announced as being between "Saargemund and Bitsch."

In execution of this order, instructions were sent during the same evening to the brigades to assemble on the morning of the 30th at their respective alarm posts, in order to bivouac there.

Having thus enumerated in detail the orders that a General commanding a cavalry division and his staff might be supposed to issue on

receipt of such an order from army head-quarters as that which has been already quoted, General v. Verdy du Vernois proceeds to discuss under the general heading of "Considerations relative to the 29th July," several of the main points that have to be attended to in preparing a cavalry division to act in advance of a main army. In so doing, he criticises the orders which he quotes as having been actually given for the 29th July; and where he deems them to be faulty he points out their defects. These "considerations," to which I have just made reference, are arranged and dealt with in the following order, viz. :—

1stly. The force and composition of a cavalry division.

2ndly. The arrival of a cavalry division upon the points where the army is concentrated.

3rdly. The task assigned to the cavalry division.

4thly. The orders issued to the division.

5thly. Points to be considered by the General of the division as to the best manner of carrying out his operations.

It is proposed briefly here to show what the author has to say upon each of these points, taking them in the order in which they have here been named.

The Third German Army, of which the author treats, had at its disposal a body of cavalry, consisting of 24 squadrons, numbering about 3,600 horses.

The number of divisions for independent working that an army ought to have depends upon the total resources that one has in cavalry; on the task that this arm has to fulfil, and on the theatre of war for which it is destined.

In considering this subject, there are three questions which naturally suggest themselves, viz. :—

a. Should a cavalry division be composed of more or less than six regiments?

b. Should a division of six regiments comprise three brigades, each of two regiments, or two brigades of three regiments each?

c. What quantity of artillery ought to be given to each division?

In answer to these questions, after discussing the *pros* and *cons* of each case, the author finally pronounces in favour of six regiments for a division. The considerations upon which his conclusions upon this point are based may be summed as follows :—

War requires the concentration of masses towards the same object. The units then that are placed at the disposal of the commander should be as strong as possible, subject to the condition of their being capable of direction by a single chief, and of their being able to satisfy the difficult demands that may be made on them. The difficulties of command reveal themselves chiefly on the actual battlefield. The rapid development of a cavalry combat demands that a chief should not only embrace with his *coup d'œil* the whole front of his troops, but also that which is passing in his neighbourhood; otherwise, the opportune intervention of reserves cannot be counted on, and it is principally by the use that is made of reserves that the influence of the chief makes itself felt. Moreover, the nature of a cavalry combat demands that the reserves should be immediately in

hand and ready to enter into action from the moment that the first line is engaged. With six regiments it is possible to satisfy these requirements, though, in any case, the task of doing so will not be an easy one, and the most gifted chief will have need of wide experience and great practice. An effective strength of four regiments will not suffice for a division of cavalry, inasmuch as the detachments, which it will have to furnish, would soon reduce it to such an extent that it would be quite unable to fulfil the rôle that, in operations of any magnitude, would fall to its lot.

With regard to the strength and number of its brigades, the formation of three, each to consist of two regiments, appears to be the subdivision most suited to the exigencies of modern warfare. The mixture of heavy and light cavalry in the same brigade is emphatically condemned, inasmuch as it often cripples, in a great measure, the activity of the light horsemen. It is admitted, however, that the exigencies of the Service often demand that it should be done. This being so, the following arrangement is pronounced to be the most preferable, viz., three brigades, one of two regiments of heavy cavalry, and the other two of two regiments of light cavalry each. The reasons for this arrangement are given thus:—

"The two brigades of light cavalry allow the General to execute deployments over a wide extent, which are necessary when the first object is to find the enemy; to concentrate his forces when contact with the enemy renders it advisable to do so; it enables him to support in good time the advanced guard, which must here be composed of a whole brigade. At the same time it enables him to give more strength and independence to the detachments which inevitably have to be furnished by a division of cavalry forming part of an army. Finally, the brigade of heavy cavalry which has the character of a general reserve will not be exposed during the operations to the same fatigues, and will allow the commander of the division, either during the operations themselves or on the actual battle-field, to throw all the weight of his forces into the balance."

It remains to consider what is the amount of artillery necessary to a division of cavalry. On the actual battle-field the cavalry division has no need to have artillery permanently attached to it, as, in case of necessity, it can draw upon the corps in its immediate neighbourhood for the guns that it may happen to want. In point of fact, experience has shown that thus to detach guns for a special purpose would merely serve to neutralize the action of a certain number of guns that might otherwise be advantageously employed. When, however, a cavalry division is pushed forward in advance of a main army, it will often find itself in positions where the support of a few guns is indispensable, and it is necessary that it should take the artillery with it, inasmuch as when thus pushed forward, it will be quite isolated by as much as one or two days' march, and will, therefore, be unable to borrow, at a moment's notice, the pieces of which it may at any time have need.

In the operations that are now being discussed, the cavalry division

has received two horse artillery batteries, and the author proposes to show, in the course of his narrative, whether this force of artillery was required, or whether a single battery would have sufficed. In the event, however, of more than one battery being attached to the division, it is advisable, in order to ensure unity of action, to place the whole artillery force under the command of a Field Officer of artillery.

Having thus discussed the wants of the combatant units, the no less important needs of the baggage columns and administrative services attached to the division are next dealt with. For a cavalry division the ordinary field hospital will be of little use, inasmuch as the troops will generally move too rapidly. Moreover, the wounded will not be in general so numerous as in infantry fights, and even in an enemy's country they will be able to get the necessary care and assistance for them. But for all this, some organization for giving this care and assistance on the battle-field at once is absolutely indispensable, and this can only be done by attaching to the division a sanitary detachment, or at least one or several sections of such a detachment. But it will often be necessary to transport the stretcher bearers of the sanitary detachment on carriages, in order that they may be at hand when wanted. These carriages will, moreover, be very useful for the transport of the wounded.

The division should also have with it a convoy of provisions, organized in a permanent manner. A convoy of thirty waggons suffices for the transport of rations (*i.e.*, *munitions de bouche* only) for a division for about two days. As to forage, there are no troops in a campaign who will find themselves so favourably situated for providing for their wants in this respect as a division of cavalry, inasmuch as it will have at its command all the resources (as yet untouched) of the countries into which it may penetrate. It should, therefore, be able to take care of itself tolerably well in this respect. It is necessary, however, to be prepared for all contingencies, and, at any rate, to make sure of a supply of oats. If, therefore, the division does not possess, or is not provided with regular convoys of forage, it must improvise them on the spot, forming them from the vehicles that have been requisitioned. The horses and the drivers of these vehicles will have to be comprised in the calculations that are made for the wants of the troops.<sup>1</sup>

## II.—*The arrival of the Cavalry Division upon the points where the Army is concentrated.*

The arrival of the cavalry division was completed on the day to which my remarks have as yet been confined, *viz.*, the 29th July, which was, as has already been shown, two or three clear days before the main army would be ready to begin active operations. It is indispensable when any large force is concerned to concentrate the cavalry thus early, if it is to fulfil satisfactorily the rôle which it has to play.

<sup>1</sup> With reference to this subject, the author states that a convoy of 180 waggons, laden on an average with 20 cwt., can transport the rations of oats for a division for three days.



It is of the highest importance for the Commander-in-Chief to have got the "touch" of his adversary, and to be keeping himself *au courant* with his movements before he sets his own forces in motion. In order, however, to get the utmost possible advantage from the services of the cavalry, and that as early as possible, it will not be sufficient to assemble it rapidly upon the points of concentration, but it will also be necessary to push it forward as far as possible towards the frontier. The frontier just before actual operations begin will generally be found to be watched by the troops of the nearest garrisons, to whom is entrusted the task of protecting it against hostile incursions. The cavalry will, therefore, be able to concentrate just in rear of these troops of observation, and to find out from them all that has up to date taken place in front. In order to do this, it is necessary that the commander of the division should hold constant communication with these foremost posts. In addition to this, he should at once send forward some squadrons on his own account beyond the most advanced posts of these advanced guards as soon as circumstances allow this to be done. In the present case the General commanding has neglected this wise precaution, doubtless because the formation of his division and other details connected with it have absorbed his whole attention. Nevertheless, he would have done well to reconnoitre the country up to the Lauter; and this would have been so much the more needful as this country was of necessity going to be the theatre of the first operations.

The comparatively limited space that the masses of an army have at their disposal when the railway has thrown them upon the points of concentration will rarely allow the cavalry divisions to have assigned to them a separate *rayon* of cantonments. They will have to find accommodation within the districts of the other corps d'armées, and they will be able to make use of all available stables and farms for their horses. In the neighbourhood of the enemy, however, it is never advisable to disperse a division beyond a certain limit, but always, on the contrary, to reserve the power of assembling the whole force in a single day. If there is a deficiency of accommodation for men and horses, it will be necessary to bivouac a portion of the troops. But it must ever be borne in mind that bivouacs are the cause of more casualties in the cavalry than the enemy's bullets, and that recourse should never be had to them when it is possible to do without them. It does not seem that there was any necessity for concentrating the division *au bivouac* on the 30th July, which the order from army head-quarters directed should be done.

In allotting cantonments between the several brigades, care and foresight and account should be taken of the nature of the service upon which it will be necessary to employ the troops. For instance, it would be a grave fault to place the heavy cavalry in the first line, and to relegate the two brigades of light cavalry to the second and third lines, inasmuch as one generally has need of light cavalry at the outset, more especially if there are detachments to furnish. It is as well also to reserve the power of being able to detach, if circumstances demand it, a regiment of light cavalry on the flanks or as an outer



wing. It is, therefore, necessary to avoid as much as possible giving the light cavalry occasion to traverse the cantonments of the heavy cavalry in order to reach the spot where its services are required. Another precaution to be taken in the majority of cases is to point out a rendezvous, in the case of an alarm being given, for the whole division, and also one for each brigade. There are several minor points to be attended to in determining these rendezvous. It is necessary to take care that they should not be too far from each other. Measures should also be taken that the regiments of each brigade can easily reach the place of rendezvous for the brigade, and that orders can reach the brigade rapidly. If these minor details be not attended to, grave mishaps may possibly ensue. In conclusion, these rendezvous should always be chosen in a forward position towards the enemy.

### III.—*The Mission assigned to the Cavalry Division.*

It will have been seen by the reader that in the official letter of instructions addressed by the Commander-in-Chief of the Third Army to the commander of the cavalry division the general situation of affairs is explained to the latter. At the same time he is placed *au courant* with all the information possessed at head-quarters of the enemy's forces, but it is added that no definite opinion as to his projects or intentions has as yet been formed. It is for the cavalry to procure the necessary data upon which to enable the Commander-in-Chief to form clear views on these points.

The attention of the cavalry leader is then called to the operations which it is possible for the enemy to execute, and he is thus enabled to steer clear of false hypotheses. The whole question has been examined with great care and discussed at length at army head-quarters, but the leader of the cavalry division is not necessarily acquainted with the general situation, nor can he know the precise intentions of the Commander-in-Chief, and he is unable therefore to judge of what is at the moment the most important information for the head-quarters to possess.

It is in this spirit and with such meaning as this that all instructions to a division of cavalry should be drawn up, when it is called upon to act as an isolated body in advance of an army. The leader of it will then know exactly what is required of him; as to the manner in which his mission is to be fulfilled, that is his affair.

In the case under consideration the head-quarter staff renders matters easier for him by some general indications. If the commander of the division is known as a thoroughly capable man, these precautions will, as a rule, be unnecessary. In every case, however, it is absolutely necessary to direct him where he should send his reports to, and up to what point he can count upon the support of other troops. To these essential instructions are added some few special hints, which it is well to put him in mind of at the beginning of a campaign; I refer to the railways and telegraphs, the wanton destruction of which is often attended with much inconvenience. It is sufficient in general to place the telegraph stations *hors de service*, in such a manner that one

can easily render them efficient again; and hence it is necessary generally to attach a detachment of telegraphists to the cavalry which marches in advance. If one penetrates into a country without any intention of remaining there long, it may occasionally be advisable to destroy thoroughly the whole telegraph plant; but it should never be done except on an order from the head-quarters of the army, where alone a correct judgment can be formed as to how far such a measure is necessary. The same remarks apply to the railways. The Commander-in-Chief can alone decide if there is any necessity to destroy them entirely; in all other cases only a partial destruction should be carried out, so that the lines should be merely disabled for a time.

There is another essential point which never ought to be lost sight of by the cavalry, viz., the necessity of finding out, if possible, what corps the enemy's troops belong to, and, above all, what is their composition. Where large masses of troops are concerned, one can seldom make even an approximate estimate of their position, except by a series of calculations. Now, it is not generally possible to know the enemy's strength before the commencement of hostilities; one must seek to ascertain it gradually during the course of operations. But if one possesses this precious information, it often becomes easy to divine exactly, by means of prisoners, what the forces before one actually are. It is obvious, moreover, that the more information one is able to obtain from various quarters, the more chance one will have of obtaining a tolerably accurate idea of the way in which the adversary has stationed his own troops. It will be seen, therefore, how important it is at the commencement of hostilities to make some prisoners, and to question them carefully. Hence the cavalry which precedes an army should pay great attention to this point.

#### IV.—*The Orders issued to the Division.*

It will have been seen that after having received his instructions from the head-quarters of the army the commander of the division at first directed his brigades to bivouac at or near their respective rendezvous. He deems it not superfluous to warn them, more especially at the outset of a campaign, that no "alarm" will be sounded, and for the following reason. As the troops occupy different cantonments, the Generals would probably think themselves obliged to repeat the signal in order to assemble their troops, and the signal would thus communicate itself to all the other corps d'armée, which would produce much disorder and useless fatigue for the troops.

With regard to the orders given to the commander of the division that his brigadiers should meet him, it is obviously a great advantage for the commander of a division, especially at the outset of a campaign, to be able fully to explain to his brigadiers, by word of mouth, his objects, intentions, and views. It will not, however, be found possible always to do this, especially when the division occupies cantonments spread over a large space, inasmuch as written orders may be sent out which demand immediate execution, and which do not therefore admit of asking for further instructions.

With regard to the artillery, it will be remembered that though the

cavalry had to bivouac at the place of rendezvous, the artillery was left on the 30th July in its cantonments. The General of Division doubtless intended to have the artillery sufficiently near the cavalry brigades to admit of its rejoining the latter at the moment of their departure the next day. It is obvious that the expediency of this measure was, to say the least of it, very doubtful. If the cavalry had to march the next day, viz., the 31st July, it would be by no means a matter of indifference that the artillery should have to march on that day a couple of leagues further than the cavalry. It might, moreover, be necessary, even on the 30th, to push on the cavalry in advance. In such a case the latter would leave its camp at a trot at once, and would be able to receive no support from its batteries; it would, therefore, have been preferable if the artillery had been ordered to reach the bivouac of the cavalry brigade on the 30th July.

With regard to the transport vehicles and convoys of provisions, those attached to a division of cavalry ought to follow in rear at a far greater distance than need be the case with any other body of troops, for the cavalry has often to change its direction, or a superior cavalry may force it to a hurried retreat. This retreat would naturally be much hampered if the train of transport vehicles were too near in rear. The latter, moreover, would run a great risk; but this does not, of course, apply to the sanitary detachment, inasmuch as it is plain that if it is to be useful it must march with the troops themselves.

Finally, it will be necessary on each occasion of quitting cantonments to indicate to the troops the points to which they ought to send their ineffective men and horses, in order to prevent their wandering here and there without any surveillance. One will not always be able to direct them to the dépôt of a corps d'armée. It is preferable that a cavalry division should organize small dépôts which will pass, like all detachments of this nature, under the orders of an *etappen* situated in rear.

V.—*Points to be considered by the General as to the best manner of carrying out his Operations.*

The movements of armies and of corps d'armées must follow the principal roads. Consequently it is these which should first engage the attention of the cavalry. It is, however, no less necessary to overrun and reconnoitre on a sufficiently large scale the country where the enemy may chance to be or that in which his detachments may be moving.

The extent of the country to be reconnoitred determines the amount of cavalry to be placed in first line, and decides as to whether the division can do the work assigned to it with a single brigade, or whether another brigade must be placed in front, and perhaps even a third. It is evident that the less one expects a resistance, the less need the line has of being compact, and the more the sphere of exploration can be extended.

The main body of the division will always have to make its actions felt in the direction where it has most chance of encountering the

enemy, or where one supposes that the main body of his forces is to be found.

It follows, therefore, that the main body ought to be placed at this point in rear of one of the wings, and if the extent of the first line is too extended for it to be able to give support opportunely to the wing that is opposed, it will be necessary to give the latter great independence and a separate mission, or even to assign to it in case of need a separate line of retreat.

Generally speaking, a cavalry General will always keep in view the necessity of concentrating his forces, and will endeavour to avoid their dispersion. But while recognising this principle, it must be borne in mind that the carrying out by a division of cavalry of the service of exploration necessitates the detachment of large bodies in cases where the extent of country, both in width as in depth, or the exigencies of the strategical situation do not admit of having a reserve in the centre.

In conclusion, a word is necessary as to the diary of the march of the division. It ought to contain a general *résumé* of events, which should serve as the groundwork of an historical narrative afterwards. But, on the other hand, no important fact should be left out, and it is as well not to omit the relation of everything that has not been given in writing, such as verbal orders, explanations, &c.

After having thus dealt with what took place on the 29th July, the author goes on to the next day, *i.e.*, the 30th, and deals with it in precisely the same manner, *i.e.*, he details the orders given and the events that are supposed to have occurred on that day, and then comments upon the movements and doings of the brigades, and of the different troops and squadrons which in the course of the operations are necessarily detached from the main body of the division. In making these comments he discusses some of the many questions which in the conduct of a cavalry division and in the varied exigencies of cavalry service must necessarily arise. I propose, therefore, to devote the remaining space at my disposal to a cursory review of such points throughout the two volumes as may seem to be most worthy of notice and remark.

With regard to the events of the 30th July, the reader may perhaps remember that it was decided on the previous night that the Chief of the Staff should himself repair the next morning to Germersheim, in order to put himself in communication with the General commanding the 11th corps d'armée. Before starting, however, the General commanding the cavalry impresses upon him once more the particular points to which he should more especially direct his attention. It may be worth while to detail *seriatim* what these points were.

Firstly. To communicate the intentions of the cavalry division to the Officer commanding the 11th corps, and to show him in general terms how the cavalry designed to carry out the task assigned to it.

Secondly. To ascertain when and up to what point the 11th corps would be able to support the cavalry.

Thirdly. To inform himself of the actual position of the most advanced posts of the 11th corps, and to ask for all the information

that the corps possessed concerning the actual state of affairs beyond the frontier.

While the Chief of the Staff proceeds to execute his mission, the General himself goes to have his interview with the General commanding the 5th corps d'armée. The latter furnishes him with all the information in his power, and the two Generals discuss at length various details regarding their main intentions and the disposition of the troops under their respective commands, so that they may the better be able to act in unison and afford each other mutual support.

When considering the events of the 30th July, General v. Verdy du Vernois calls attention to the fact that during the whole of that day, from early morning till nightfall, the General of the cavalry division has been constantly occupied by business matters connected with his division. The moral which he deduces from this is the necessity of not hurrying the first movements of a cavalry division. He adds, however, that the occasions will be rare when time will be available to make all the preparations that are advisable. Concentrate, therefore, your cavalry in good time, so that the General who commands it may be able to put himself in communication with the head-quarters of the army, and you will thus be able to avoid the inconveniences that often result from undue precipitation. If these precautions have been neglected, or if they have not for some reason or other been taken, and the divisions of cavalry are only assembled at the last moment, one is often forced to make use of them immediately upon their arrival at the point of concentration, and it will then be far more difficult for the cavalry to carry out the task assigned to it.

With regard to the professional acquirements that it is necessary that the commander of a cavalry division should have, the author expresses his opinion as follows:—"All the plans and combinations which we have supposed General A. to have formed shows in how great a degree the task confided to him demands that he should be conversant with the operations of war on a large scale. The commander of an independent cavalry division will often find himself in positions which demand a more profound acquaintance with strategical problems than the commander of a division of infantry, which generally forms part of a corps d'armée, and which has only to conform to orders which emanate from superior authority. Herein lies a most cogent reason why cavalry Generals should accustom themselves by study and reflection to realise the exigencies of actual warfare, for which manœuvres on a large scale afford but little opportunity. If they do not do this, even with the best cavalry in the world they will never be able to reap anything like the full advantage that may be derived from this brilliant and costly arm. It is true that there are plenty of officers who think otherwise, and who believe that merely those qualities which ought in some degree to be the inseparable attributes of every cavalry officer, are sufficient for General Officers of that arm—love of danger; confidence in his own courage, and, in the case of disaster, in the swiftness of his horse; chivalrous ardour, victorious to-day and vanquished to-morrow; failing at one point and suddenly appearing at another;

"indefatigable tenacity in sticking to the traces of the enemy; all these brilliant qualities are indispensable for every cavalry officer, but they will not of themselves suffice for the General Officers of that arm, especially if they are to conduct operations independently at the head of nearly 4,000 horsemen. . . .

"The cavalry combat in its rapid course and development demands the closest accord between the leader and his troops, and the highest possible skill and aptitude on the part of the former in handling the latter. No position in fact makes such claims on the talents of a leader as the fight of a cavalry division, and, in my opinion, in the whole domain of the art of leading troops there is no more difficult task."

There is another point upon which the author comments at some length, and which seems to the writer of this paper to be worthy of note, inasmuch as it is a matter which it behoves any cavalry officer who is called upon to lead a cavalry force at the outset of a campaign to have carefully weighed and thought out in his mind. It must often happen that a cavalry force, operating in front of a main army, will come into contact with large bodies of the enemy's infantry. In such cases as these, while recognizing that it is the mission of the cavalry constantly to preserve touch of the enemy when once they have got it, and to do their utmost to maintain their ground up to the point to which they have pushed their explorations, the question that naturally suggests itself is this, viz., what is the limit up to which cavalry should commit itself to a combat with infantry?

Now the charge against infantry, as well as fighting dismounted against it, will always entail enormous sacrifices upon the cavalry. A single attack upon even a moderate scale will suffice to cripple a regiment, and it may be to reduce it to a single squadron; and if the attack assumes larger proportions, it may easily result in the ruin of the whole cavalry division. On the other hand, there should be no hesitation in sacrificing a portion of a cavalry, or, indeed, of any other Force, when the losses suffered will be largely compensated by the results that may be obtained. This, then, is a question that requires to be solved on its own independent merits in each case that arises when a cavalry regiment is operating in front of a main army, and which will always have to be critically considered and weighed; otherwise the cavalry may find itself carried away by its natural desire to engage the enemy, and will be committed to a fight before the consequences of thus acting are fully realised and foreseen. These consequences may easily be the ruin of a fine cavalry Force without any useful result being obtained. Taking all this into account, it is clear that in presence of infantry marching against it a cavalry division will often do well to yield step by step rather than expose itself in trying to make a stand. In fact, it may be said that only under exceptional circumstances should it commit itself to a combat with infantry. Nevertheless, it is necessary not to lose sight of the fact that it is always useful to impede the march of the enemy, even though the general situation does not imperatively demand that it should be done. At any rate, it is always possible by thus acting to gain a certain



amount of time, which is an advantage that is never to be despised. Great care should, however, be taken to avoid incurring losses which would be quite out of proportion to the advantages likely to be gained.

In order to be fully informed as to the strength and movements of the enemy, it is by no means necessary to commit oneself to an engagement with his infantry. It is enough everywhere to prevent his cavalry from masking the movements of the columns that follow, and to force the infantry to show itself in first line. One can then be certain of having information which, if not complete, will at any rate be sufficient. In retiring step by step one's own cavalry will be able to observe the direction taken by the enemy's Forces, and to ascertain with tolerable accuracy the strength and composition of them. A retreat executed in this manner will always allow a cavalry division to carry out its main purposes and objects without prejudicing the general plan of operations by its abandonment of the ground that it occupied.

If, moreover, one bears in mind that the nature of the ground will often present favourable opportunities for masses of cavalry to make a temporary stand, it may be readily understood how easily they may retard the march of the enemy's columns when his cavalry has been driven back in rear of his infantry. The enemy is obliged to deploy his columns before all the lines of defence that present themselves, and as soon as he has reached them to reform his columns, unless he chooses to march deployed across country for leagues together, and always in a fighting formation. Whatever may be the method that he adopts, it will always occupy twice as much time as a simple march ahead. In addition to this, the horse artillery batteries which accompany the cavalry will have full scope for moving about rapidly (escorted by some squadrons) from one point to another, and can render it necessary for the enemy to shelter himself from their fire as much as possible. Finally, if it is borne in mind that the attack of a position that *appears* to be strongly occupied requires to be prepared and preceded by artillery fire, and always demands a certain amount of time, it may readily be imagined how masses of cavalry can even without much fighting retard and harass an enemy's march. It is never without importance to delay by six or eight hours a march that should not have taken altogether more than that time.

When a cavalry Force has to act in this manner on the defensive, it will do well not to deploy too soon all its available force, but it should content itself at first with an occupation of the most important points. Owing to the rapidity with which it can move from one point to another, it can afford to wait before employing the rest of its available strength till the enemy has given clear indications of the direction of his attack.

A discussion of the manner in which a cavalry Force should best be managed when acting on the defensive, and when its object is to delay and retard the advance of the enemy's infantry, naturally brings the author to the question of dismounted service. Upon this point the author seems to the writer of this paper to be somewhat vague and indefinite in the conclusions that he draws. After pointing out



the principles and general rules that should govern the practice and instruction of cavalry acting on foot, and observing that this arm will be called upon in future to act thus far more frequently than heretofore, he expresses his opinion that dismounted duty should be looked upon as a wholly exceptional means of action—a view which no one, of course, would attempt to combat or dispute. In the very next sentence, however, he remarks that circumstances very often place cavalry in exceptional positions, &c., &c. He is careful to dwell, and with good reason, upon the great services that one or two dismounted squadrons, judiciously posted, are often able to render to its own side, especially in such a case, for instance, as when a brigade is forced to retire before superior numbers. The dismounted men, by their fire, will then be able to arrest the enemy's pursuit, and prevent a retreat from degenerating into a rout.

When endeavouring to hold an enemy in check and to retard his advance, it is absurd to suppose that the fighting of cavalry on foot can have the same characteristics or the same tenacity as that of infantry under similar circumstances. In other words, protracted skirmishing combats, in which the first line is only reinforced in case of necessity, and the reserves are held back as long as possible, are not its rôle. Beyond a certain limit it will never succeed by thus acting. It will best attain its object by at once occupying the first line of defence, and making use of all the arms at its disposal, as soon as the direction of the enemy's attack is ascertained. It is only by the number of projectiles that it can send against the enemy, and by the inherent power that belongs to the defence, that it will be possible for the cavalry on foot to hold its ground for a time against infantry.

General v. Verdy du Vernois sums up as follows the principles of action that should be observed by dismounted cavalry when acting on the defensive:—

"The points where it is necessary to make a stand should be occupied provisionally.

"All the rest should be held in reserve. 'From this reserve should be drawn the files or squadrons necessary to watch over the safety of the led horses, and to back up the men who are fighting on foot.

"From the moment that the enemy attacks any part of the position, the whole of the reserve should be brought up into the first line, unless there is a fear of being obliged to defend it at other points. In this case a portion must be kept in hand in order to guard against this contingency.

"All the efforts of the men thus brought up into first line should be devoted to preventing the enemy's advance."

There is another point, moreover, with respect to dismounted service to which the author draws special attention, and to which all cavalry soldiers will do well to pay heed, viz., the absolute necessity of withdrawing dismounted men in plenty of time to regain their horses. On this subject he remarks as follows:—"In acting dismounted it is not only necessary to occupy a position or to gain a vantage ground from which the men can make use of their firearms, but also to devote quite as much attention towards assuring the retreat of the

“dismounted men in good time, so as to allow them to remount in comparative security, and carefully to adopt this practice to the real exigencies of actual warfare. It is not always easy to observe this precaution, but it is the more necessary to do so, since at manœuvres the men always succeed in remounting their horses, and the squadron then retires at a trot, and in good order, even when the enemy’s skirmishers are only about 100 paces off.”

It may here be remarked that this mistake of not retiring dismounted men till the last moment, and consequently much too late, may be seen committed at any time, not only at our own manœuvres at Aldershot or elsewhere, but also by French and German troops at their manœuvres, whenever any dismounted duty falls to the lot of the cavalry. It is obvious that if at the moment of remounting bullets begin to fall into the midst of a group (of men and led horses), which is practically disarmed for the moment, some of the horses will break loose in all directions, and the squadron will in all probability not only be put *hors de combat*, but will also run a great risk of being completely destroyed.

With regard to another point, viz., whether a division of cavalry, when sent forward to act independently, should, if possible, have any infantry attached to it, the author expresses himself plainly enough as follows:—“A division of cavalry, provided with a good fire-arm, ought to find in itself sufficient power to carry out to a successful end any enterprise that the task assigned to it may entail. The more it is persuaded that this task cannot be fulfilled without having recourse to the infantry, the more temptation it will have to make appeal to that arm, and it will end by transposing the rôle that each has to play, *i.e.*, if to the infantry in front is to be entrusted the duty of reconnaissance. As to having the cavalry followed immediately in rear by small detachments of infantry, that would be to expose the latter to great risk, and would hamper the march of the former, . . . . . Masses of cavalry ought to ensure the service of exploration for their own army with the greatest independence and without the assistance of infantry. A cavalry which is unable in this respect to act without its infantry will never be worth the money which it costs. This, however, by no means excludes the services of infantry when it can act in concert with cavalry without exposing itself to undue risk.”

If, for example, a great extent of territory has to be occupied rapidly, either in order to spread terror through the country or to prevent fresh forces of the enemy being organized in it, or to deprive the adversary of its resources by carrying them off, then, when it is expected that only insignificant hostile forces will be encountered, it will be useful to attach to the cavalry divisions some bodies of infantry. They will find ample scope for work in the occupation of important points such as bridges, tunnels, &c., in the surveillance of magazines, in the investment of fortified places, &c. Thus after the battle of Sedan two battalions of infantry were attached to the cavalry which preceded the march of the German Army upon Paris. Under the circumstances in which the Prussian Army found itself, there was

no fear of seeing the cavalry suddenly repulsed, and being consequently obliged to leave the infantry in the lurch, inasmuch as the few Forces which the French had left did not admit of the latter keeping the field. Where only small detachments of infantry are concerned, arrangements can generally be made to carry them in some kind of carriage or other.

Another point upon which the author dwells at some length is the directions which are given by the General commanding the cavalry division to his Generals of brigade. In the cavalry it may be necessary, at any instant, to detach whole brigades, and, consequently, it is necessary to give to the Generals of brigade far more detailed instructions than in an infantry division. When the latter has some detachments to send off during its march, one has the time necessary to explain the situation with all requisite calmness and composure to the Officer commanding the detachment, and to give him his instructions. In general, this detachment will always be in direct connection with the main body of the division, which will always be able to support it in case of necessity. In the cavalry, however, which has large tracts of country to reconnoitre, it is far otherwise, as movements have to be executed with rapidity. The regiment or the brigade passes completely out of the ken of the General of Division, who thenceforward loses all control over the action of these detached troops, and the isolation in which the latter find themselves gives them a far greater independence than is the case in the infantry. It is on this account that, in the present instance, the General of Division addresses himself principally to the commandant of the brigade which is going to be detached, and which will, consequently, remain for a long time out of his immediate control. He does not deem it of any use to enter into any details as to the operations which this brigade will have to execute, he is only able, in fact, to give general directions.

The principal point which he endeavours to impress upon the different leaders is the expediency of keeping their respective brigades so far in hand that they might be able, in case of necessity, to accord to each other mutual support in the course of one day.

General v. Verdy du Vernois' remarks upon the events of the 31st July are divided into several chapters, in which he deals with and discusses various necessary details. Among these chapters may be noted one, not only on the length of the column formed by a division of cavalry of a certain strength, but also on that formed by each component part of a division, and the time that must be reckoned on and allowed for its deployment at different places. There is also a chapter on the formation of the column of march on active service, which will be found worthy of attentive study. The composition of the advanced and rear guards to be formed by a cavalry division on active service when thus sent forward on an independent mission, the reasons that should guide and regulate their strength under different circumstances, and the distances which they should maintain from each other, are herein discussed, and every detail, down to the conduct of the patrols, scouts, and flankers is carefully gone through.

It will, perhaps, be worth while to examine, somewhat in detail, what the author has to say on two or three of these points.

Firstly, then, with regard to the strength and composition of the advanced guard of an isolated division of cavalry, he insists strongly on the necessity for its being of a very considerable strength. In fact, his words are as follows:—

“In the majority of cases a regiment will not suffice to perform the service of advanced guard of an isolated cavalry division, and it will be well to employ for that purpose an entire brigade, even when the division should only be composed of two brigades.”

The reasons that he gives for this opinion may be briefly stated as follows:—The division of cavalry which precedes an army ought to reconnoitre the country to a great distance and over a wide lateral extent, inasmuch as it has to cover the whole extent of the front of its own army. But it will not be able to fulfil its rôle satisfactorily if it contents itself merely with sending out patrols in its front, which will be forced to fall back whenever they may meet with hostile patrols which may chance to be a little stronger than themselves. The object is to ascertain if large bodies of the enemy are in the neighbourhood, and in order to do this it is necessary to be sufficiently strong to repulse his small detachments. Hence the necessity of backing up the patrols by supports. The strength of these supports (to be sent along the principal routes) ought not to be such as to dislocate the whole division, *i.e.*, one ought not to employ for this purpose entire regiments, but it will be impossible to avoid using at least some squadrons for it. The number of squadrons that will have to be thus detached will, of course, depend upon circumstances, upon the number of roads upon which the cavalry is marching, &c., but it will be nearly always necessary to employ for each of these detachments more than a squadron.

In any case, moreover, in addition to the network of advanced *éclaireurs*, the division has still need of an advanced guard, which should shield it from the necessity of having to deploy its whole strength upon the slightest occasion. This advanced guard should have a certain strength, because it forms the first reserve upon which to fall back for the reinforcements which may be immediately necessary in front. Again, it will perpetually happen in the course of the march, that a troop or squadron will have to be detached, either in this direction or in that, from unforeseen causes, &c.

For all these reasons, the author considers that a less body than a brigade, after supplying the various calls that would be made upon it for detachments, would not have a residue of sufficient strength to fulfil satisfactorily the functions of an advanced guard.

Secondly, the General points out that a cavalry division has no necessity for a reserve during the march. Such a body would, in fact, be more useless to it than to an infantry division. If it comes to a question of fighting, the first thing to be done is to deploy the division as rapidly as possible. It should be deployed in several lines, one of which naturally forms the reserve. On the other hand, a column of cavalry when isolated has great need of a properly con-

stituted rear-guard. This rear-guard ought not to be too weak where large masses of troops are concerned; indeed, in certain cases, it will be necessary to employ for it an entire squadron, the last peloton of which should follow at a considerable distance. Its mission is not one simply of police, it is rather to watch constantly that nothing should happen unexpectedly in rear. If the enemy does make his appearance, the rear guard should at once attack him with impetuosity, without taking any heed of disparity of numbers. The great point is to give the regiment that is most menaced time to deploy.

With regard to the artillery its place is as far as possible to the front in the column, but there is no good reason for pushing it forward right into the "zone of exploration" at manœuvres; two or three squadrons are often seen to go off with a battery of horse artillery to the front,—a plan which entails many inconveniences. These squadrons, in fact, are obliged to extend, and only reserve a small group as a nucleus. This latter in its turn has often immediately to leave the main road as soon as the enemy makes his appearance, and the artillery has to follow across country over any kind of rough and uneven ground. The result is that its horses have a great deal taken out of them long before the battery is in a position to produce any useful effect. It has need of some little time in order to be able to regulate and to ensure the accuracy of its fire, but the first squadrons of the enemy present but a very limited and constantly shifting target, and seek to shelter themselves by taking advantage of the natural conformation of the ground, and at once change their position as soon as a shell bursts near them. In addition to this, a cavalry force of the strength of a few squadrons is so comparatively weak that it has unceasingly to watch over the safety of the battery, and consequently it is hampered in its movements. It is therefore only under exceptional circumstances that a battery of artillery should be given to the regiment of cavalry that heads the column. The artillery, in fact, has no business with the squadrons of *éclaireurs*, who have often to take lateral directions, and who are constantly weakened by the detachments which they have to send out. Its place is rather with the second regiment of the brigade which forms the advanced guard. There are, of course, exceptions, as when, for instance, the enemy has but little cavalry, or when that which he has is badly organized and trained.

Finally, the author sums up, and gives a *résumé* of the mistakes which, in his opinion, have been committed during the two or three days' operations which he has narrated, and which he has dissected in such careful detail. The limits of this paper have not allowed me to follow up the actual operations undertaken by the troops, but perhaps the author's general summary of the errors committed may here be quoted. It is as follows: "The march of the division was not suitable for a large body of cavalry; no use was made of squadrons launched far ahead in advance, and the march seems to have been conducted more like a practice at manœuvres, where sufficient space is not available for explorations far ahead."

"The movements on the Lauter, and those of five squadrons at the head of the column before Reidseltz, were productive of loss of time and of a needless halt, while, on the other hand, the whole division, after having crossed the Lauter, engaged in the pursuit of a single squadron of the enemy, and thus advanced further than was intended.

"The advanced posts were, like the bivouacs, organized too much on the model of those required for the detachments in peace manoeuvres, and were not suitable to the exigencies of the peculiar position in which an isolated large body of cavalry finds itself."

The author does not mean to imply that these faults will always be committed at the opening of a campaign, but if these are not committed others of a similar nature will be, which only experience gained on service will correct, and which can only be guarded against by reflection, by study, and by practice, in time of peace.

In conclusion, I cannot do better than finish this very imperfect sketch of General v. Verdy du Vernois' interesting work than by quoting his own words, which are as follows:

"The opinions which in the foregoing studies have been set forth are only the individual views of the author, and they make (let this be here repeated once more) no claim whatever to infallibility. If, however, they only rouse and fix the student's attention upon the many points that are worth considering in reference to this important and difficult phase of cavalry service, and cause him to exercise his own judgment thereupon, then the object of this work will have been fully attained."

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### A RUSSIAN VIEW OF THE INDIAN ARMY.

Contributed by Lieutenant-Colonel A. H. WAVELL, 41st Regiment.

"VOENNI SBOENIK," St. Petersburg. Published monthly, annual subscription 7½ roubles.

In the September number of the above publication is a paper, a summary of which, as it gives a Russian view of our Indian Army, may prove interesting.

The writer has obtained his material from the following official papers:—

"Correspondence on the subject of the Organization of the Native Army," presented to both Houses of Parliament by command of Her Majesty, 1877.

"Statistical abstracts relating to British India from 1865 to 1875."

He commences as follows:—

"To form a body of mercenary troops from among the natives of a conquered country, whose sole functions are to keep order in that



"country, is indeed a strange experiment. We do not find a parallel to it in the history of ancient Persia, who employed Greek mercenaries; nor in that of the Roman Empire, whose legions were latterly recruited from Germans and other barbarians. Neither the Persians nor the Romans employed these mercenaries against their own countrymen, nor did the motley hordes of Timour and Genghis Khan furnish examples of auxiliaries, drawn from a conquered nation, employed in keeping it in subjection. Russian military history, it is true, supplies instances of peoples who have been brought into subjection taking service in the ranks of the Russian Army, as for instance, the Tartars of Siberia and several tribes of the Caucasus; but they did not form a part of the regular Army, and the duty of maintaining the authority of Russia among their fellow countrymen was not intrusted to them. To form a regular Army from the natives of a subjugated country, and to confide in them to keep down their fellow countrymen has been achieved by England only and by her only in India."

The writer does not propose to trace the causes which have rendered this possible, but briefly attributes it to an astounding want of patriotism on the part of the natives of India, and to the fact that the tyranny of native rajas is more insufferable than the British yoke, and further, that men are tempted into the ranks of the Army, (1) by good pay and the comfortable conditions of life in the Army, (2) through the fact that the soldiers belong or did belong mostly to a caste whose trade is war. "The history of the English wars in Hindustan furnishes many examples where the Sepoys have fought better for British interests than even the British soldiers. In the Mutiny of 1857, a large number of the native regiments remained faithful to the British Government. In 1868 the Expedition to Abyssinia was partly composed of native regiments; and small expeditions against the Lushais and Dufflas have been furnished entirely from the native Army." Notwithstanding this, the writer gathers from the reports and correspondence under review, that of late days, complaints of the deterioration of the native army have been heard, and that a growing disinclination has been manifested on the part of British Officers to join the Indian Army, resulting in a lack of subaltern Officers, especially in the Madras Presidency.

As regards numbers, an analysis of the figures contained in the Parliamentary Report is given, and the conclusion arrived at, that about two-thirds of the British force in India are natives of the country. As regards the composition of this force, *divide et impera* is the guiding principle of regimental organization, so that in one company are found Hindustanis, Sikhs, Pathans, Jats, &c. "English statesmen opine that people of different descent and political and religious sympathies are not likely to combine in a political conspiracy, and on the other hand, it is easy to arouse among them a spirit of competition for distinction in the Service, and thus to form from the mass an obedient tool for furthering British interests. There are, however, weighty objections to be considered on the other side. The calculation may prove fallacious if the



"leaders have not sufficient skill and tact to subordinate these conflicting national sympathies and aspirations to the furtherance of British interests. Can the British rulers place thorough reliance on the influence which Englishmen can exert over this heterogeneous mass of soldiers? The experience of former years, when India was conquered by Sepoy soldiers, is apparently on their side. But now comes a weighty consideration. Formerly in Sepoy regiments, in each company there were some European Officers—the native Officers were in the second rank—now it is not so—not only is there not a sufficient number of English Officers, but the Government obviously has no hope of obtaining more. Companies have, therefore, been doubled, and the double company placed under an Englishman; the majority of the Officers in a regiment are, therefore, natives. One English Officer is considered sufficient to infuse British patriotism into 118 natives. Most English generals and commanders in India report that the native Officers of the present day are satisfactory as a class, and that weakening the British element in Sepoy regiments need not be a source of danger; there are, however, sceptics on this point, but their voice is hushed by the all-powerful consideration of money. European Officers in India are so costly."

Regarding class regiments the reviewer says, "Besides regiments of mixed castes there have long existed regiments consisting only of Sikhs and Goorkhas, who have distinguished themselves by their bravery; only it must be remembered that their glories were chiefly gained at a time when the European element was numerous—one English Officer to twenty men. Now, this is no longer the case; the native Officers, into whose hands has fallen not the apparent but the real command of the companies, although subjects of the Shah-i-Shah, Padishah Victoria, are still natives of India and not Britons." On the alleged difficulty experienced by the authorities in obtaining Officers for the Indian Army, the reviewer says, "It is obvious that strenuous efforts must be made by the British Government to attract British Officers to fill these vacancies. But how to do this? In France or with us the vacancies in the subaltern ranks are easily filled by promoting capable non-commissioned Officers, but in England social prejudices are so sharply defined that this is impossible. He who has once worn the soldier's uniform will never wear that of an Officer, even if he should display the genius of a Napoleon. The rank of sergeant must be the limit of his ambition; under these circumstances some other method of filling the ranks of Officers must be discovered." Pay alone, we are informed, would not be a sufficient inducement, and the steps taken by the authorities to accelerate promotion are detailed, viz., limiting the tenure of commands to five years—increased retiring allowances, &c. The concluding remarks on this portion of the subject are as follows:—"Have these measures really attained the desired result—a constant supply of subaltern Officers? We cannot answer. It may, however, be doubted, if we reflect on the fact that military service is not really popular with the English people, and that in England there is not

“found that small noblesse which furnishes the German Army with its sub-lieutenants.” The growing expense of the Army we are told disturbs the Indian Government. The expense of living has increased enormously: in places where, in 1848, a man could keep himself and family for 6 rupees monthly, he now requires 11 rupees. In Cawnpore the price of rice has increased from 1860 to 1875 in the proportion of 7:15. “This growing expenditure cannot be checked by cunning schemes for promotion and retirement, and the British Government has been compelled to resort to the expedient of reducing the personal establishment. This has been done of late years as far as is possible, especially in the matter of Officers; but the rank and file cannot be further reduced without endangering the security of the country, and here the Indian Minister in England has to face a question the solution of which is possibly beyond human capacity. Even now the ranks of the Sepoy Army are not filled by men of the Kshattriya or warlike caste, as was the case in the days of the ‘Honourable Company,’ but men of the lowest castes are enrolled who are less exacting, but at the same time probably less to be relied on. Not long since there was a talk of sending 50,000 troops from India to Egypt to occupy that country, from whence they might operate in Syria, or on the shores of the Hellespont; but beyond this the natives of Hindustan could not be employed in Europe; the cold of Peking was found unbearable by them. It is true there are in the Sepoy ranks Afghans and Beloochees, who are better suited to stand a vigorous climate than the inhabitants of Bengal and the Carnatic; but their number is not large, and if they were sent out of the country the Anglo-Indian Government would not be in a position to make a forward movement in the north-west beyond the frontier towards Candahar and Herat.” In the Parliamentary papers extracts are given from the confidential reports of general Officers on the different regiments of the native Army on the difficulty or otherwise of obtaining recruits, and on the general efficiency as regards drill, discipline, &c., of the various corps. Some of the latter reports being by no means favourable, the writer of the article quotes a number of these extracts and remarks, “Reports on the condition of particular regiments, whether in praise or blame, however strongly expressed, are not to be relied on to furnish us with a stand-point from which to judge the value of the Sepoy Army as a large and important Government institution. The causes from which these conditions arise may be of a temporary nature. Far more weighty are the recorded opinions of men who have spent a great portion of their lives in service in the East. In this category are to be placed the interesting reports of Generals Brownlow and Blake. The former of these Officers, while approving of the present organization of the Sepoy regiments, disapproves of the way in which they are recruited. He opines that taking soldiers from among the lower classes of the people has lowered the dignity of army service, and that soldiers of the type of those who fought under Wellesley and Clive no longer exist. Even now, however, much might be done if only the leaders were up to the mark. Among

“ Asiatics, says Brownlow, the personal influence of the commander is of paramount importance. Obviously native Officers are in a position to exercise this personal influence, acquainted as they are with the character and inner thoughts and feelings of their fellow countrymen. Brownlow, therefore, invites the particular attention of Government to the question of the Subadars and Jemadars. He approves of the system of making them virtual company commanders, but is silent on this point—how are the new Captains situated as regards their European brother Officers? The answer to this question is important, for it is easy for these latter, living apart from the native Officers and raised above them, to be deceived by an apparent zeal and a knowledge of regulations, and to fail to penetrate their real political feelings and sympathies which Asiatics know how to conceal with treacherous facility. General Blake reports favourably on the native Officers, especially those who have served a long time in the same corps; but this long service, although it tends to keep up *esprit de corps*, has this objection, that the Officers become old men and block the way of the younger ones.”

Of the pay of the native Officers the writer says it is now as good as that of the Officers of most European armies, and concludes his paper with the following remarks:—“ All these reports having been attentively considered by the highest military authorities in India, were worked into the shape of a project for the organization of the Sepoy Army by Lord Napier of Magdala. The result is that the English Government has decided that the Subadars shall henceforward be considered the immediate commanders of the Sepoys, whilst for British Officers are reserved the higher posts in the regiment. The pay of the native Officers has been raised, and the condition of the Sepoys improved.

“ The result has been an increase of the military budget to the extent of 12 lakhs of rupees; but the Government has not grudged this expenditure, and the budget has been squared by a reduction of expenditure in other directions. It is obviously an acknowledged fact that henceforth the Empress of India must maintain her rule over the country, and guard it from external enemies by the assistance of the people of India itself. British regiments in India are still of prime importance, but there is not between them and the Sepoys that gulf which existed in former days. If the political considerations on which this reorganization of the native Army is based prove correct, we may congratulate England on having solved a problem whose solution has hitherto been beyond the force of any nation. But is their calculation to be relied on?”

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# NOTES ON THE-WAR STRENGTH OF THE FRENCH ARMY IN THE FIRST HALF OF THE YEAR 1878.

By A. FREIHERR VON FIRCKS.

Translated by permission of Lieut.-General v. WITZLEBEN, from the  
"Militar-Wochenblatt,"

By Captain L. V. SWAINE, Rifle Brigade.

No trustworthy reports exist of the war-strength of the different services in the French Army. The Cadre Law of the 13th March, 1875, gives the war-strength only of the officers, non-commissioned officers, musicians, tradesmen, and officials (Beamten), and of such men who, although belonging to the different services, do not actually fall-in in the ranks; but no mention is made under that law fixing the actual strength of privates, which, in the absence of all Pay and Provision Regulations, &c., for troops in the field, can only be arrived at by approximation.

Nevertheless, the pamphlets on the new organization published in France since the late war, the French military newspapers, and the occasional statements by members of the Government in the Houses of the Legislature, distinctly show the prevailing opinions amongst the leading circles in the Army; and, from these sources, an approximation of the numerical strength of the privates in the French Army becomes of sufficient value by which to judge the military capacities of our western neighbour. Records exist giving the number of men in the country liable for service; and, if a deduction is made from the authenticated numbers who come up for the annual training in each year, of those who, by death or by becoming unfit, are removed, a fairly reliable estimate may be struck of the number of privates both fit and trained for service in the Reserve<sup>1</sup> and the Territorial Army. By these records it is also possible to judge how far, by calling in all available men on furlough and those of the Reserve and the Territorial Armies, the field force and that for garrison and dépôt duties may be brought on a complete war footing on a sudden mobilization being ordered; and whether, in addition, a sufficient number of trained men remain over for other formations. Lastly, it may be established how the numbers of thoroughly trained and efficient men will compare with the numbers of those who, having served but a few months

<sup>1</sup> The land forces of France are divided into the Active or Regular Army, and the Territorial Army. The service of a Frenchman in each is as follows:

In the Regular Army.....	5 years
In the reserve of the Regular Army .....	4 "
In the Territorial Army .....	5 "
In the reserve of the Territorial Army .....	6 "

Total length of service..... 20 " H.

either in the Standing Army as "*deuxième portion du contingent*,"<sup>1</sup> or during the latter part of the war as "*gardes-mobiles*,"<sup>2</sup> have been but superficially trained. These considerations are of importance, as deciding the amount of cohesion existing between the parts, and the possibility of employing such a force at a moment's notice.

It is not intended here to enter into a description of the actual distribution and strength of the French Army, as this is sufficiently well known, or may be easily ascertained by reference to the German military journals or to the "*Gotha Almanak*."

Yet it may be shortly noticed, that in partitioning the country<sup>3</sup> into regions, to each of which an army corps is allotted, great consideration was attached apparently to the positions of the main lines of railway leading towards the eastern frontier, by which a concentration in that direction of the field force would be practically accelerated; the geographical position of France probably prompted this measure, as both the sea and the Pyrenees facilitate the defence of her northern, western, and southern frontiers.

The mobilization of the different arms of the Service is also more effectively prepared than before; and on this head it is necessary to mention three important rules:—

1. On application to the sub-division offices in each army corps district,<sup>4</sup> the establishment of the field force will be completed in men, horses, waggons, &c., to war-strength.

2. The necessary saddle, draught, and pack horses, as well as carts, will be obtained by requisition; the amount required, in case of a mobilization, having been already fixed in time of peace, and apportioned to the different parishes.

3. The necessaries in arms, accoutrements, and clothing, requisite for the reserves of the field force, are kept in regimental possession of the troops; whereas the waggons and harness for the horses of the supply trains, &c., are kept ready for issue at the district headquarters of each army corps.

<sup>1</sup> The yearly contingent of recruits is divided into two portions, the first of which serves with the colours the whole time required by the law, the second portion for one year only. H.

<sup>2</sup> The national guard "*Mobile*" is a force which was created by Marshal Niel's project of 1867. The guard could only be called out by a special law; it was composed of all the young men who, on account of the numbers they had drawn, were not included in the contingent, and of all those who had obtained substitutes; finally of all those exempted by the action of the law of 1832. Judged by its behaviour in the campaign of 1870-1, the force can hardly be considered to have been a success. H.

<sup>3</sup> The territory of France is divided for military purposes into eighteen regions, in each of which an army corps is stationed. The head-quarters of the regions are as follows:

**Army Corps Head-Quarters.**

I. Lille.	VII. Besançon.	XIII. Clermont-Ferrand.
II. Amiens.	VIII. Bourges.	XIV. Lyons.
III. Rouen.	IX. Tours.	XV. Marseilles.
IV. Le Mans.	X. Rennes.	XVI. Montpellier.
V. Orléans.	XI. Nantes.	XVII. Toulouse.
VI. Châlons-sur-Marne.	XII. Limoges.	XVIII. Bordeaux, H.

<sup>4</sup> Each territorial region contains 8 sub-divisions. H.

But up to the present moment very insufficient preparation has been made for clothing and equipping the men of the Territorial Army. To insure the punctual arrival of officers and officials (*Beamten*) from furlough, free tickets by all railways are granted them, and the men, no longer summoned to join by individual notices, are now called together entirely by public announcement.

It may be accepted that, under the new organization, a mobilization in France can be carried out as rapidly as in the German Empire, although it is probable that some branches—their cavalry, for instance—might not be fully completed in horses in so short a time. Yet this want would confine itself to the *depôt* squadrons. The great army supply trains and the siege parks are still much in arrear. Although of the former the necessary waggons and equipment for the field-railway and field-telegraph divisions are complete, and the men for these services are forthcoming; yet, as far as is known, very insufficient preparations exist to complete the supply department, the field hospitals, the field post-office, the reserve ammunition and siege trains.

(NOTE.—The organization of the field post and treasury departments during a war was published by a decree of the President of the Republic on the 24th March, 1877, but the officials of these two branches will only be appointed at the time of a mobilization; at present also the waggons belonging to these services are still wanting.)

The mobilization of the regiments quartered in Algeria must be slower than that of those in France proper; but steps have been taken to insure the rapid conveyance of those regiments, as well as of the Algerian special corps, to the mother country. The two regiments<sup>1</sup> of field artillery belonging to the 19th Army Corps<sup>2</sup> remain in France, and, in their place, twelve garrison batteries are transferred to Algeria; and likewise the *depôts* of all the French regiments quartered in Algeria are stationed in France.<sup>3</sup>

Further strength is given to the French field force by adding to it four regiments of marines and a portion of the marine artillery. This last force is organized for field work, and intended for service both in the large seaport fortresses and for field work in the colonies.

A portion also of the fourth battalions of the infantry regiments of the line which have been doing duty latterly in Paris, Lyons, and the Eastern frontier fortresses, are, it is understood, in case of a mobilization, to be formed provisionally into regiments and divisions, and attached to the field force.<sup>4</sup>

It may be accepted that out of the fourth battalions of the infantry regiments of the line, eight or nine complete infantry divisions could be formed, leaving forty-eight or thirty-six such battalions for garrison duty in the Eastern fortresses, which, together with the troops of the

<sup>1</sup> To each army corps is attached a brigade of artillery, consisting of two regiments. H.

<sup>2</sup> This is the Algerian army corps. H.

<sup>3</sup> This is a mistake as regards two battalions of rifles and the two regiments of hussars, the four *depôts* of these troops are in Algeria.

This note and others initialed L.A.M., are extracted from "*L'Avenir Militaire*." H.

<sup>4</sup> There are four battalions, exclusive of *depôt* troops, in an infantry regiment. H.



Territorial Army, would satisfy the first requirements of the frontier fortresses. The *depôt* troops of the Regular Army would be available for the garrisons in the interior of the country.

The field batteries for these newly-formed eight or nine reserve-infantry divisions also exist without having recourse to the *sortie*-batteries of the fortresses, as each of the thirty-eight regiments of field artillery has even in time of peace two *depôt* batteries, which are horsed and manned the same as the rest of the field batteries. Were each regiment to give up only one of these batteries, it would allow each of the above-named divisions to receive from four to five field batteries; but were they to give up both, the corps artillery of five of the reserve army corps could also be formed. With the exception of the 6th and 7th Army Corps, each artillery brigade still requires one field battery to raise it to the establishment laid down for it in the Cadre Law, but these have been estimated for in the Budget of 1878.

Judging by the French military journals it seems evident that a general conviction prevails in the French Army that to arrive at great results in field operations demands above all a strong force of artillery. It is, therefore, most probable that all efforts will be directed to mobilize all the field batteries which exist in peace time, as well as the *depôt* batteries, and to employ them in the field force. For this purpose the ten reserve infantry divisions (including the marines) offer the most fitting opportunity for carrying this out in accordance with the corps formations. The French war administration is almost certain to adopt this plan, that is, at the same moment that the army corps of the Active Army are being concentrated, to form five reserve infantry army corps in the neighbourhood of Paris and Lyons. These troops must, therefore, be added to the total available strength for the first field operations, as nothing will impede their being called into the front line, as soon as the Territorial and Reserve men have become somewhat steady.

It has been already mentioned that no trustworthy reports exist giving the war-strength of the separate battalions, squadrons, and batteries; but the Cadre Law contains a sufficient account of the numbers of Officers, non-commissioned officers, musicians, &c., from which it may be concluded that the squadrons and batteries will retain their former strength, whereas that of the infantry battalions will be considerably increased. The strength of effectives, as proposed by the Army Commission, though not accepted under the Cadre Law, was placed at a higher figure than in the German Army; but it is not expected that the company in the French infantry will consist of more than 250 men all told (including Officers, musicians, &c.), as otherwise the existing number of Officers and non-commissioned officers would not nearly suffice. The battalion will, in all probability, take the field 1,000 strong. As in time of peace the French captain commands but a skeleton company, and, moreover, is not mounted in the field, difficulties in the tactical employment of large companies will probably arise.

The establishment of Officers and non-commissioned officers in the cavalry is ample. Nor are the squadrons that take the field weakened



by furnishing orderlies and escort duties, since to each army corps a squadron of "Éclaireurs" is attached on whom this special work devolves.<sup>1</sup>

The men and horses of the fifth squadrons of regiments may be drafted into the four taking the field, and should more horses be wanted, these can be obtained, as the law directs, by requisition.

As the number of squadrons in the French Army is, in comparison with the strength of the infantry and artillery, below the average, it may be anticipated that the French War Office will take every care to place the squadrons themselves up to their full strength on taking the field. Yet judging by the experience gained by the Germans, many of the requisitioned horses will become utterly useless during the first concentration of the Army, and after the first heavy marches. The strength of a squadron taking the field may be put at an average total of 150.

No difficulty is anticipated in procuring the additional number of horses for the artillery in raising it to war-strength, as there is an ample number of available draught horses in the country. The field batteries consist of 160 men and 120 horses, the horse artillery of 155 men and 170 horses. In fixing these numbers, the fact that some of the field batteries would be armed with a heavier gun was duly considered. Each battery is of 6 guns.

Of engineers there are in the French Army 26 battalions of sappers and miners, with 4 dépôt companies, 4 companies of engineer train, 4 railway companies, and 1 pontoon regiment of 14 companies.<sup>2</sup> The Budget of 1878 estimates for a second pontoon regiment of similar strength. In the event of a mobilization the railway companies have to find 8 railway divisions of 1,100 men each, to work on the lines of communications in rear of the Army. These, however, do not, strictly speaking, belong to the field force. The strength of the engineer and pontoon companies will probably be 250 men.

The transport of the army (not including that for the artillery and engineers, who have special trains of 57 and 4 companies respectively), consists of 20 squadrons of 3 companies each, and 12 so-called mixed companies for the Algerian army corps. In Algeria the strength of each company is 304 men and 296 horses or mules, which may be also accepted as the war-strength of the rest of the transport companies. But, as may be seen, this amount will only suffice to carry the provisions and forage, &c., actually present with the army. For the field hospitals, for the transport of the second line, and for the reserve army corps formed at the moment of a mobilization, special transport columns will have to be made up from the reserve men of the cavalry, and by requisitioning carts and horses.

In the absence of squadrons of "éclaireurs," the *legion mobile* of the gendarmerie of Versailles,<sup>3</sup> who are mostly unmarried men, or the

<sup>1</sup> Yes, but on paper only. L'A. M.

<sup>2</sup> Unfortunately the pontoons are part of the artillery, which has not yet been able to form the second regiment. L'A. M.

<sup>3</sup> The gendarmerie of Versailles was formed in 1871; its special duty is to protect the National Assembly, but it can be employed elsewhere if necessary. H.

Republican Guard,<sup>1</sup> may be employed as escorts to General Officers or their Head-Quarter Guards. The gendarmerie has 8 companies and 1 squadron, the Republican Guard, 24 companies and 6 squadrons. The field police may be formed out of the numerous gendarmerie in the departments. The field telegraph is worked by engineers, and their necessary waggons, &c., are kept at the central stores in Paris.

The available army of France, for immediate operations, consists of 19 army corps, 6 divisions of cavalry, and 5 infantry reserve army corps, and only contains those troops for which, in peace time, strong cadres exist. In second line, after deducting for garrison duty in the fortresses and large towns, the remainder of the Territorial Army would be concentrated, although, for the moment, its formation is not sufficiently advanced that its use, for the first few months after a mobilization, would be of much account in the field. Yet, for duty on the lines of communication, it may be well employed, and prevent the necessity of weakening the field force for this purpose. Each of the 19 army corps is composed as follows:—

Two infantry divisions of two brigades each, and one brigade of light cavalry of two regiments, each of four squadrons. In each infantry division there are four regiments of three battalions each, five field batteries, one company of engineers, and, in one of the divisions, a rifle battalion. The brigade of cavalry may detach squadrons for duty with the infantry divisions, when required.

The corps artillery consists of six field and two horse artillery batteries (and, if necessary, two heavy position batteries, manned by the garrison artillery), one company of engineers, and one company of the pontoon train. In each army corps there is also one transport squadron and one squadron of "éclaireurs."

The combatant strength of a mobilized army corps consists (not including Staff, Head-quarter Guards, transport, and administrative services), in round numbers, of 25,000 infantry, 1,200 cavalry, 2,870 artillery with 193 guns, and 1,000 engineers. If the two position batteries be added, the totals will be raised by 370 artillery, with 12 guns. The rationing strength of a French army corps may, according to these figures, be estimated at 34,000 men and 5,500 horses.

Each cavalry division consists of three cavalry brigades, each of two heavy or two light regiments and a battery of horse artillery, in all, of 24 squadrons and three batteries of horse artillery, and, under certain conditions, a company of engineers is added. According to German ideas, these cavalry divisions have more waggons attached to them than appears necessary, and their powers of locomotion are considerably hampered thereby. The combatant strength of a cavalry division is 3,600 cavalry, 465 artillery with 18 guns, the rationing strength being about 4,300 men and 4,400 horses.

(According to other information, it would appear to be intended to form nine cavalry divisions, each of two brigades, of which three divisions would consist of cuirassiers, one of chasseurs d'Afrique, and

<sup>1</sup> The Republican Guard is a municipal force entrusted with maintaining the security of Paris. H.

five of a light and a dragoon brigade each. This would entail three extra divisional Staffs.)

Each of the five reserve infantry army corps would have two infantry divisions, each of two brigades. In each division there would be four infantry regiments, one rifle battalion, five field batteries, and one company of engineers. One of the divisions will be formed of four regiments of marines, and the others will be made up of combined infantry regiments (each of three of the fourth battalions of the line regiments); their batteries are the mobilized depôt batteries.

A corps artillery will have eight field batteries. For the five infantry reserve army corps there are available: a battery of horse artillery, 26 mobilized depôt batteries and the marine artillery. These may be manned, when mobilized, by the garrison artillery, as is already done in peace times in Algeria. The formation of the remaining 13 batteries will not meet with more difficulty than exists in mobilizing the reserve batteries in the German Army. There is also, for each corps, a company of engineers, and a company of the pontoon train available.

The combatant strength of a mobilized reserve infantry army corps will, therefore, consist of 26,000 infantry, 2,880 artillery with 108 guns, and 1,000 engineers, the rationing strength being 32,500 men and 4,000 horses. The mixed companies of the Algerian army corps are alone available for the heavy transport; that is, about two transport companies for each reserve army corps.

For the engineer train of the independent Armies there are still four pontoon companies, four railway companies, and eight engineer companies ready, as well as the necessary artillery and transport train. The "gendarmérie" of Versailles, or the Republican Guards, are available to furnish the Head-quarter Guards of the Commanders-in-Chief of the armies.

By employing every available man, and deducting only the actual requirements for the garrisons, the French Army can, under favourable circumstances, be concentrated, for field operations, in the following strength:—

Troops.	Infantry Battalions.	Rifle Battalions.	Squadrons of Cavalry.	Field Batteries.	Horse Artillery Batteries.	Engineer Companies.	Railway Companies.	Pontoon Companies.
19 Army Corps .....	456	19	152	304	38	57	..	19
6 Cavalry Divisions ..	..	..	144	..	18	..	..	..
5 Reserve Infantry Army Corps ....	120	10	..	89	1	15	..	5
4 Engineer Reserves..	..	..	..	..	..	8	4	4
Total .....	576	29	296	393	57	80	4	28

The Head-quarter Guards, squadrons of "Eclaireurs," and transport trains are not included in the above.

## 1206 NOTES ON THE WAR-STRENGTH OF THE FRENCH ARMY

The rationing and combatant strengths of the whole French Army of operations would amount to the following totals:—

Troops.	Rationing strength.		Combatant strength of the Troops (exclusive of Staff).				
	Men.	Horses.	Infantry and Rifles.	Cavalry.	Artillery.	Guns.	Engineer and Pontooners.
19 Army Corps .....	646,000	104,500	475,000	22,800	54,500	2,052	19,000
6 Cavalry Divisions .	25,800	26,400	..	21,600	2,800	108	..
5 Reserve Infantry Army Corps ..	162,500	20,000	130,000	..	14,400	540	5,000
4 Engineer Reserves	4,500	1,000	..	..	..	..	4,000
4 Army Head-quarter Staffs .....	1,200	1,500					
	840,000	153,400	605,000	44,400	71,700	2,700	28,000

Under the head of artillery only the men of the batteries have been included, not those of the parks and ammunition trains. Although a few differences may exist in the formations of the army corps, on the whole it may be accepted that the French Army is sure to reach the above strength. Possibly, for instance, the 19th Army Corps, on taking the field, may be given two rifle battalions and three batteries of horse artillery, without further alterations taking place in the other corps; possibly also that one or two engineer companies may be left in the frontier fortresses, &c. Possibly also the division of marines may be added to the front line of the field force, and together with one of the divisions of the Algerian corps form a 20th Army Corps, thus leaving an Algerian division to take its place in the reserve.

For the interior of the country the following garrison and reserve forces remain available.

*a. Troops of the Line in France proper.*

- 36 Fourth battalions of infantry regiments of four companies each.
- 144 Depôt battalions of infantry regiments of four companies each.<sup>1</sup>
- 30 Depôts of rifle battalions of two companies each.<sup>2</sup>
- 70 Depôt squadrons of cavalry regiments.
- 5 Companies of rough riders.
- 45 Garrison batteries of the 19 divisional regiments of artillery.
- 10 Companies of artillery artificers.
- 3 Companies of artillery laboratory workmen.
- 2 Depôt companies of the pontoon regiments.
- 4 Depôt battalions of engineers.
- 4 Marine (infantry) battalions.
- 12 Batteries of marine artillery.

<sup>1</sup> Two companies. L'A. M.

<sup>2</sup> One company. L'A. M.

The garrison batteries of the divisional artillery regiments could be easily raised to double their strength by calling in the reserve, and would be available to mobilize the dépôt batteries of the thirty-eight regiments of field artillery.<sup>1</sup> In fact it would be necessary to adopt this plan if the dépôt batteries of the regiments of the artillery are to be mobilized and attached to the army corps of the reserve. There is an ample supply ready of guns, waggons, &c., and the horses could be requisitioned in the interior of the country.

After forming the reserve infantry army corps, the remaining fourth battalions of regiments, which already in peace time garrison the fortresses on the eastern frontier, would form the cadre of the garrisons of these places on the declaration of war. The marine infantry and artillery, remaining available after the formations of the infantry divisions, provided for in the mobilization scheme, will garrison the most important sea fortresses, and will be able to provide a great number of reserve men, as at present no organization of troops for sea defence exists.

*b. Troops of the Line in Algeria.*

1 Rifle battalion of four companies.<sup>2</sup>

7 Fourth battalions of the Zouave and Turko regiments, each of four companies.

7 Dépôt battalions of the Zouave and Turko regiments, each of four companies.

1 Foreign legion of four battalions, each of four companies.

6 Companies of African light infantry.<sup>3</sup>

4 Fusilier and one pioneer disciplinary companies.

3 Regiments of Spahis, in all, seventeen squadrons.

8 dépôt squadrons of Chasseurs d'Afrique.

The irregular horse (Gums) of the three provinces.

3 Troops of rough riders.

3 Garrison batteries.

6 Mountain batteries.

6 Mixed transport companies.

The Foreign Legion and the African Light Infantry (so-called Zephyrs) would probably on a mobilization be strengthened by an augmentation of companies.

Only 17 squadrons of Spahis are included in the strength, as one of the squadrons is quartered in the French settlement of Senegal. Nor is any account taken of three field batteries, manned by the garrison artillery of the French artillery regiments at present quartered in Algeria, as it is supposed they will be attached to the reserve infantry army corps.

<sup>1</sup> It may be observed that 38 of these 57 batteries have been allotted by the author already as position batteries of the 19 corps d'armée, and that 12 others are in Algeria. Total allotted already 50. L'A. M.

<sup>2</sup> Plus two dépôt companies to be deducted from the troops of the line in France proper. L'A. M.

<sup>3</sup> Three battalions of four companies. L'A. M.

The above-mentioned force, together with the Algerian territorial troops, will under ordinary circumstances suffice to garrison the fortresses and posts, as well as maintain order, in Algeria.

*c. The Territorial Force in France proper.*

145 Infantry regiments of 3 battalions, each of 4 companies.

(145 dépôt companies of the infantry regiments).

About 20 companies of *chasseurs-forestiers*, both of the active and territorial force.

About 20 battalions of *douaniers* (Customs):

18 Cavalry regiments of 4 squadrons.

18 Artillery regiments of 8 batteries, and 1 transport company.

(Note). Regiments are to have from 8 to 24 batteries each, but at present only 8 can be formed, as only 485 officers of the territorial artillery are available. The number of men would allow of completing 12 batteries for each army corps.

18 Engineer battalions of 4 companies.

18 Squadrons of army transport, each probably only of 2 companies.

As up to the present time the cadres of the Territorial Army are only partially filled with a sufficiency of officers, it may be accepted that for the next year or two the formation of separate dépôt companies for infantry regiments will not be carried out. About half the companies of the *chasseurs-forestiers*, and of the battalions of *douaniers* still consist of serviceable men, and could be employed as service companies with the field force under the Law of 2nd April, 1875. But it is still more probable that they may be drafted into the mobilized territorial divisions, which will consist, after deducting their quota for garrison duty in the fortresses, of about 40 territorial infantry regiments and of about 36 (two with each artillery regiment) territorial field batteries. These divisions will be employed to relieve the actual field force from all duties on the lines of communication, or to take up defensive positions in occupied districts, or, if necessary, to give the field force direct support in the mother country. These mobilized territorial divisions would not be fit for active service for some time after the commencement of a war, nor will they for some years to come possess the military worth of the German landwehr reserve divisions.

Nor will it be possible to attach to these divisions a sufficient number of efficient squadrons, making them, therefore, for independent duty in the field, but of very limited use. This last-mentioned disadvantage will continue to be felt in this force; whereas after 1885, the training of the men of the Territorial Army will have reached the point required under the Army Organization Act. From that date half of the men first for service in the Territorial Army will have served four or five years in the Regular Army.

A few engineer companies will probably be attached to each mobilized territorial division; the necessary transport could be formed from the transport squadrons of the Territorial Army by requisitioning horses and waggons, and by drawing according to the requirements, as is also the custom elsewhere, the men from the abundantly available

cavalry, who, for want of saddle horses, remain dismounted and unemployed.

The formation of two field batteries in each regiment of artillery of the Territorial Army has been provided for, and each regiment has a company of artillery train in readiness.

The reserve of the Territorial Army has not been considered at all in the above calculation, as for it no organization exists.

*d. Territorial Troops in Algeria.*

3 Regiments of Zouaves of 3 battalions each of 4 companies.

5 Battalions of rifles of 4 companies.

4 Squadrons of Algerian cavalry (*chasseurs*).

3 Squadrons of Algerian *chasseurs-forestiers*.

13 Batteries of artillery.

These troops are raised in the three Algerian Provinces as follows:—

Province of Algiers: 1 regiment of Zouaves, 1 rifle battalion, 1 squadron of cavalry, 1 squadron of *chasseurs-forestiers*, and 6 batteries of artillery;

Province of Oran: 1 regiment of Zouaves, 2 squadrons of cavalry, 1 squadron of *chasseurs-forestiers*, and 4 batteries of artillery;

Province of Constantine: 1 regiment of Zouaves, 4 rifle battalions, 1 squadron of cavalry, 1 squadron of *chasseurs-forestiers*, and 3 batteries of artillery.

The battalions, according to the muster of 1876, are of an average strength of 900 men, the squadrons of 150 men, and the batteries of 200 men.

No account is taken for the present of the 5,000 available men of the reserve of the Algerian Territorial Army, as they have not been trained nor organized; nor of the volunteers of the Arabian horsemen.

*e. Police and other Formations.*

The legion mobile of the gendarmerie of Versailles (consisting of 8 companies and 1 squadron, together 1,203 men and 202 horses) and the Republican Guard (3 battalions of 8 companies and 6 squadrons, together 4,014 men and 752 horses) will be probably employed as field police, and, as far as can be spared, at the staffs of the armies.

The legions of police in the Departments of France (consisting of 20,897 men and 12,067 horses) must be left behind to keep order in the country and would be of considerable value in undertaking certain duties in the Territorial Army. As troops no account is further taken of them.

The police of Algeria (900 men and 646 horses) cannot be otherwise employed.

The militarily organized fire brigades in the French towns, as well as in Algiers and Constantine, are under military administration, but are only available for local defence in the fortresses.

The organization of the 8 railway divisions of the principal railway



# 1210 NOTES ON THE WAR-STRENGTH OF THE FRENCH ARMY

companies exists, in time of peace, on paper only, and when mobilized are of 1,100 men each. They are intended for duty on the lines of communication, and are, therefore, counted with the train, &c., formations of the "etappen-" troops.

The reserves of the Territorial Army (calculated at 625,000 men in France and 5,000 in Algeria) are without training and in no wise organized.

After concentrating the field force, including the infantry reserve army corps, the total strength of the available troops, of all sorts, in the garrisons and of the mobilized territorial divisions, both in France and in Algeria, may be thus calculated :—

Troops.	Battalions of Infantry.	Customs, or Rifles and Chasseurs-Forestiers, Companies.	Squadrons of Cavalry.	Field Artillery Batteries.	Garrison Artillery Batteries.	Pontoon and Engineer Companies.	Railway Companies.	Train Companies.
<i>In France.</i>								
Non-mobilized Line and Marines..	184	60	75	38	77	18		
Territorial Troops .	345	50	72	..	108	62		
Mobilized " " " " " "	120	50	..	36	..	10	..	36
Special formations.....	..	..	87	..	..	..	8	
Total.....	649	160	234	74	185	90	8	36
<i>In Algeria.</i>								
Non-mobilized Troops of the Line.	20 <sup>1</sup>	4	28	6	12	..	..	6
Irregular Cavalry (Gums).....	..	..	18					
Non-mobilized Territorial Troops .	9	20	7	..	13			
Special formations.....	..	..	4					
Total.....	29	24	57	6	25	..	..	6
Grand total .....	678	184	291	80	210	90	8	42

In the above numbers the dépôt companies of the territorial regiments are not included, the rough-rider troops are calculated as squadrons, the legions of mounted police are taken at an average of one squadron to each Department, the batteries of garrison artillery, of which three have, as already mentioned, been told off to the infantry reserve army corps, are counted as doubled in strength and employed partly as dépôt batteries to the field artillery, and the irregular cavalry are roughly estimated.

The combatant ranks of the troops of all kinds in the garrisons of the interior and of the territorial divisions, not including staffs in fortresses, recruiting officers, and non-combatants (as police, transport, railway divisions, &c.), may be thus calculated :—

<sup>1</sup> ? L'A. M.

Troops.	General Total.		Infantry and Rifles.	Cavalry and Guns.	Artillery.	Field Guns without Depot Batteries.	Engineers and Pontooners.
	Men.	Horses (Cav.)					
<i>In France.</i>							
Non-mobilized Line and Marines .....	233,150	11,250	199,000	11,250	18,400	..	4,500
Non-mobilized Territorial Troops .....	400,580	10,800	357,000	10,800	17,280	..	15,500
Mobilized Territorial Troops .....	140,260	..	132,000	..	5,760	216	2,500
Total.....	773,990	22,050	688,000	22,050	41,440	216	22,500
<i>In Algeria.</i>							
Non-mobilized Line ..	28,080	4,200	21,000	4,200	2,880	36	
Guns .....	3,000	3,000	..	3,000			
Non-mobilized Territorial Troops .....	15,350	1,050	11,700	1,050	2,600		
Total.....	46,430	8,250	32,700	8,250	5,480	36	
Grand total ....	820,420	30,300	720,700	30,300	46,920	252	22,500

The total rationing-strength, inclusive of the garrison and district staffs, of the trains, of the railway divisions, police and non-combatants with the troops, would raise the above figures by 55,000 head; and in like manner at least 25,000 more horses of artillery, train, police, and staffs must be added of the troops remaining in the country.

The total strength of the army of the French Republic, not counting the reserve of the territorial army, may be computed at the following figures:—

Troops.	Rationing Strength.		Combatants only, excluding Staffs, &c.				
	Men.	Horses.	Infantry and Rifles.	Cavalry and Guns.	Artillery.	Engineers and Pontooners.	Guns without Depôts.
Mobilized Field Force ..	677,500	133,400	475,000	44,400	57,300	23,000	2,160
Reserve Infantry Corps..	162,500	20,000	130,000	..	14,400	5,000	540
Mobilized Territorial Army .....	179,000	11,000	132,000	..	5,760	2,500	216
Garrisons in France ....	671,000	35,000	556,000	22,050	35,680	20,000	
Garrisons in Algeria ....	48,500	11,000	32,700	8,250	5,480	..	36
Total.....	1,738,500	210,400	1,325,700	74,700	118,620	50,500	2,952

France already possesses the requisite number of men and horses for obligatory service to set this powerful force into motion. According to the Census of 1872, there were in France 17,982,511 males, of whom 1,509,000 were between the ages of twenty and twenty-five. Annually 302,000 young men enter the age for obligatory service, of whom about 162,000 are either enlisted or join the army voluntarily. If this number is put at an annual average of 150,000 men, then deducting therefrom, according to the report of General Chareton (1873) the known average numbers of deaths, or of those who by being invalided become unserviceable, there remain for the five classes of the Regular Army a total of 704,714, for the four classes of the reserves of the Regular Army 510,294, and for the five classes of the Territorial Army 582,523, making a grand total, without counting the reserves of the Territorial Army, of 1,797,531 men.

In addition there remain about 800,000 men between the same ages, perfectly fit, but untrained, of whom, by law or by being the only support to their families, 500,000 have been exempted in peace time from service, and 300,000 are enrolled in the auxiliary branches of the Army. Besides these there are still about 625,000 men in France and 5,000 in Algeria, who belong to the six older classes of compulsory service of the reserves of the Territorial Army. Of this mass of untrained men,<sup>1</sup> numbering together 1,430,000, the War Minister, in the event of a mobilization, has absolute control, and he will, no doubt, find employment for them in the transport and administrative services. Horses also are abundantly available in the country. In 1872 there were in France 872,911 geldings, and 1,257,832 mares of over four years old, 299,129 mules, and 450,625 donkeys. On the whole of these 140,000 will have to be requisitioned on a mobilization. (NOTE.—A French Memoir reckons the requirements at 175,000 horses.) There are also 351,654 stallions of upwards of four years old in the country.

There are 1,500,000 horses employed on farms, of which about 400,000 are available for military work; there are besides in the country about 90,000 horses otherwise employed also available.

There may arise some difficulty in providing in the country the full number of 40,000 saddle horses, so that it will be necessary to obtain these by timely foreign purchases. The mules may be partly employed for artillery, or as pack animals in the transport or ambulance services.

In 1876, the men of the year 1867 passed over from the reserve of the Regular to the Territorial Army, and during the last exercises in the Autumn of 1875, numbered still 143,052 men, of whom 53,188 had been trained in the Regular Army, and 88,155 had served in the "Garde Mobile" during the Franco-German War. Only 1,709 men were totally untrained. The classes dismissed since the year 1872 will naturally possess a by far greater number of trained men, as the number of recruits, who have joined annually since the universal service has been introduced, is in comparison greater.

In the year 1877, the Regular Army with its reserves, and the Territorial Army was made up out of the following classes:—

<sup>1</sup> Excepting a part of the reserve of the Territorial Army. L'A. M.

Regular Army: classes of 1875, 1874, 1873, 1872 (with the current class of 1876 which is however not yet incorporated).

Reserve: classes of 1871, 1870, 1869, and 1868.

Territorial Army: classes of 1867, 1866, 1865, 1864, and 1863.

Reserve of Territorial Army: classes of 1862, 1861, 1860, 1859, 1858, and 1857.

Of these classes the following numbers were, during each year, incorporated into the Regular Army:—

1857.. 99,585 men.			
1858.. 136,898 "	1863.. 95,560 men.		
1859.. 99,785 "	1864.. 95,542 "	1868.. 95,000 men.	1872.. 105,000 men.
1860.. 99,829 "	1865.. 95,467 "	1869.. 95,000 "	1873.. 151,031 "
1861.. 99,871 "	1866.. 95,000 "	1870.. 140,000 "	1874.. 152,425 "
1862.. 96,513 "	1867.. 95,000 "	1871.. 140,000 "	1875.. 147,295 "
Total 632,481 men.	Total 476,569 men.	Total 470,000 men.	Total 555,751 men.

These numbers contain both parts of the contingents as well as the volunteers, but the men, who without any previous military training entered the "Garde Mobile," National Guard, and the corps of Franc-tireurs during the Franco-German War, are not included.

The chief portion of these last, at present in the Territorial Army, has not only gained a certain amount of training in the camps of instruction since the war, but actually took part during the last months of it in the operations round Paris. These men would, therefore, after a short time, be perfectly able to take part in active operations.

If, from the above calculated numbers of trained men, are deducted, according to General Chareton's report, those who are or become unfit for service, the actual number of trained men for 1877 may be approximated as follows:—

Troops.	Trained men.	Deducted from these by Deaths and Unfitness.	Number of trained men available for service in 1877.
Regular Army .....	555,751	42,147	513,604
Reserve .....	470,000	70,270	399,730
Territorial Army .....	476,569	106,419	370,150
Reserve of Territorial Army..	632,481	193,258	439,223
Total.....	2,134,801	412,094	1,722,707

According to this statement there are 913,334 men in the Regular Army and its reserve who have been thoroughly trained in the Regular Army itself. As the numbers called out to serve during the last year

or two, in the so-called "deuxième portion du contingent," only amounted to about a third of the effectives, and, in the earlier years, to fewer still, while in 1872 none were called out, the numbers of those actually fit for service in the Regular Army and its reserve, who have been but superficially trained, may be placed at about a fourth of the whole, or 228,334 men. According to that calculation, there still remain 685,000 fully trained men available for the Regular Army and its reserve, as well as 16,000 marine infantry and 4,000 marine artillery, to form the cadres of troops of the line and their dépôts. As dépôt troops, there are still the last class (for the moment, that of 1876) available, but not yet mustered, which however, in the event of a mobilization, would be called out at once. If their number is roughly placed at 155,000 men (inclusive of the recruits for the marine infantry), there will be in case of a war, both for the different services of the Regular Army and dépôts, and such of the force of marines as may be employed on shore, altogether, 1,088,334 men available, viz:—

685,000 fully trained troops of the field army.  
 20,000 " " " of the marines.  
 228,334 men of the "deuxième portion."  
 155,000 untrained recruits.

Total. . 1,088,334 men.

Besides, there must still be at least 20,000 thoroughly trained marines available, who, if not required for coast defence, would belong to the reserves.

The men of the "deuxième portion," during the last two years, have completed their full year's service in the ranks;<sup>1</sup> formerly six months sufficed. It is therefore probable that the-war strength of the whole of the field force and of the reserve infantry army corps, at a mobilization, would consist almost entirely of thoroughly trained men, of at least one full year's service. A portion of the older reserve men, together with those of earlier classes who belong to the "deuxième portion," and with the last class of recruits, would be available for garrison and dépôt duties.

That this clearly necessary measure, for the sudden employment of the field force and first reserve, is practicable, may be seen by comparing the rationing strength with the combatant strength of the troops of the line:—

Troops.	Rationing strength.	Combatant strength exclusive of Staff, &c.
Mobilized Field Force .....	677,500 men.	599,700 men.
Infantry Reserve Army Corps.....	162,500 "	149,400 "
Total.....	840,000 men.	749,100 men.

<sup>1</sup> This will not be the case till the spring of 1879. L'A. M.

There are available thoroughly trained men	705,000 men.
Two classes of the "deuxième portion" of one year's service .....	105,617 „
Total.....	810,617 „

According to this, there remain available for garrison and dépôt service :—

Trained men, of at least one year's service..	61,517 men.
Men of the "deuxième portion," of only six months' service .....	122,717 „
Untrained recruits of last class .....	155,000 „
Total.....	339,234 „

From previous calculations it will be seen that the following troops of the line and of marines remain over in the interior of the country:—

	Combatants, exclusive of Staff, &c.
In France proper .....	233,150 men.
In Algeria (without Gums) .....	28,080 „
Total.....	261,230 „

There then remains a surplus of 78,004 men, which will from the first allow the dépôts to be placed on complete war-strength, even if, in the event of a mobilization, only half of the last untrained class be mustered.

The difference between the rationing strength and the combatant strength of the troops equalizes itself, if the considerable number of professional soldiers is considered. According to the Budget of 1876 there were, exclusive of the combatant ranks, 26,407 men in the Staff and administrative branches; and besides, according to General Chasseloup-Laubat's report on the Law on Recruiting (1872), there are in the army, on an average, 50,000 re-engaged men (*kapitulanten*) and volunteers for five years, as well as 13,600 foreigners and natives of Algeria, mostly excluded from the above total of the recruits of the Regular Army and Reserve. The Head-quarter Guards (*Eclaireurs* squadrons, Republican Guard, and Garde Mobile) are also included in the provisioning-strength, but they, however, are only partly recruited from amongst the men liable for service.<sup>1</sup> In the administrative branches the men noted for auxiliary service will be employed.

If the numbers of the available trained men be taken separately by branches of the service, in the same manner as has been done for the whole army, it will be seen that each branch of the Regular Army may be brought on a war footing by calling in those who, after an average service of four years, have passed into the reserve, and, in some cases only, the two last classes of the "deuxième portion." In the cavalry

<sup>1</sup> True, at least, as concerns the two last named corps, but the troops furnished by these corps are included already among 50,000 enlisted and re-engaged men of General Chasseloup-Laubat. L'A. M.

a considerable portion of its reserve will not be required, but will be employed in the transport branch, for which otherwise, to a greater extent, men of the earlier reserves, who have only had six months' training, would be called in. In the artillery, the existing reserves amply suffice to man all the batteries, and it would be only in the artillery train—as, for instance, in the ammunition train—that mostly men of the “deuxième portion” will have to be employed. For the engineers, also, the required number of reserves to raise them to war-strength is available. In the infantry, the training-time of the existing men in the regular battalions varies. The rifle battalions and the regiments of marine infantry, Zouaves and Turkos, are raised to war-strength, with thoroughly trained men, partly from the reserve, who have served four years, partly, especially in the African regiments, from the cadres of their fourth battalions which remain behind in Algeria. But it is not considered wise to weaken the cadres of the fourth battalions of the regular line regiments, by withdrawing from them their older and thoroughly trained men, as these men are intended partly to form the reserve infantry army corps, and partly to garrison the fortresses in the immediate neighbourhood of the theatre of war. Nor will the cadres of the dépôt battalions of the line regiments on a peace establishment admit of any reduction, if they are to fulfil the mission as garrison or reinforcement troops.

The three field battalions of the line regiments will, therefore, receive in augmentation to war-strength, in addition to the thoroughly trained reserve and the two last classes of one year's army training of the “deuxième portion,” one class of reserve of only six months' training.

In the army corps of the field force the battalions of the line will be thus composed:—

320	men	peace establishment		
380	„	reserve of four years' service.		
200	„	„	one	„
100	„	„	six months	„

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Total: 1,000 men.

The last 100 men can only be considered as very doubtfully useful in the field, as their only superficial training took place three years ago, and has been nearly all forgotten again in the meantime.

The fourth battalions of the regular regiments of the line in the reserve infantry army corps, who are intended as cadres to garrison the fortresses, will be thus made up:—

320	men	peace establishment
680	„	reserve of only six months' training about four or more years ago

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1,000 men.

Only the fact, that the greater portion of these reserves have in the meantime been called out for exercise, and were also actively engaged



during the Franco-German War, may make it possible that the fourth battalions, after a short time, would be available for active field operations, although the steadiness of these troops would at first be insignificant. Perhaps it is intended to employ the surplus of the marine reserves in these battalions.

The Territorial Army is calculated at a rationing strength of 580,000 men, and of a combatant strength of 540,840 men; of which 140,260 men of the total strength would be available for special duties such as guards on the lines of communication and mobilized territorial troops, &c. There are about 370,150 men between the proper ages available who have been trained in the Regular Army, of whom, however, from 90,000 to 100,000 only served for a few months. Besides, there is still a very considerable number of serviceable men available who served during the Franco-German War, either in the "Garde Mobile," "Garde Nationale," or in the "Franc-tireurs;" and also in an extreme case it is calculated that there are still 439,000 older trained soldiers in the reserve of the Territorial Army.

There is, therefore, no want of tolerably trained men to complete all branches of the service to a war footing, but the want of a sufficient number of cadres will considerably diminish their value and use. The companies of "*douaniers*" and "*chasseurs-forestiers*" would be the soonest available for service in the field, also the artillery and engineers for the defence in the fortresses; but the cavalry would be the least serviceable. In the infantry the two last classes,<sup>1</sup> who lately were called out for a few weeks' training in the reserve, would, to a certain extent, serve as cadres, although there would not be more than 500 of them for each territorial battalion. The "*douaniers*" fit for military service number 20,000, and the "*chasseurs-forestiers*" 4,000 men. The non-commissioned officers (*chargen*) for these troops would be easily found amongst the Customs officers and sub-rangers; the men are throughout old soldiers. The Territorial Army in Algeria, according to the reports of 1876, can be concentrated up to its full establishment, but consists chiefly of men without any military training. The three squadrons of mounted "*chasseurs-forestiers*" are an exception, and would be immediately, after concentration, fit for active service.

In conclusion, a few remarks on the composition of the higher tactical units and the condition of the tactical training of the troops, may not be out of place.

The army corps of the Regular Army are organized similarly to those in Germany, although no cavalry regiment is permanently attached to the infantry division. These are always brigaded together. But provision has been made to attach cavalry to an infantry division acting independently.

The infantry divisions have been given a very numerous artillery (five batteries) which, in consideration of the rather loose cohesion of the parts, appears judicious. The cavalry divisions of the Regular Army are formed of brigades of two regiments and one horse

<sup>1</sup> There will not be two until the 1st July. L'A. M.

artillery battery each. The divisions are much hampered, especially in their reconnoitring duties, by a far too large amount of transport than actual requirements warrant. The necessity to place requisitioned horses into the ranks, is a second drawback to the employment of these divisions, which is not improved by the indifferent horsemanship of the riders. The men serve throughout for five years in the Regular Army, but are recruited chiefly from unsuitable elements, and are thereby much retarded in their military education.

The infantry reserve army corps consist almost entirely of infantry, artillery, and engineers. Cavalry could only be posted to them by previously breaking up two independent cavalry divisions. Apart from the marine infantry division, which is formed from picked battalions, the tactical employment of the infantry will be but small at first, as the battalions can only be raised to war-strength by introducing a disproportionate number of superficially trained reserves (*deuxième portion*). The artillery and engineers, on the other hand, are thoroughly ready for war.

The infantry and artillery in the mobilized territorial divisions would only after a considerable time be fit for active service, although for duty on the lines of communication they could be employed after a few weeks' training. The territorial cavalry would only be available for orderly duties.

The non-mobilized troops of the line, the *depôt* troops, and the non-mobilized territorial troops, would suffice for the requisite duty in the interior, either in garrisons or to replace others called to the front. For the defence of the most exposed places on the frontier a sufficiently powerful number of cadres of troops of the line (infantry and artillery) is available.<sup>1</sup>

The organization of the French Army chiefly aims at bringing a large number of men annually in the Army, by which means in a few years, but probably at the expense of an unequal amount of training, a powerful reserve is formed, which will make it possible, at a given moment, to take the field with an overwhelming strength.

To gain this point it was necessary, in time of peace, to create a number of cadres for the troops intended to take the field. Therefore for all branches of the service cadres for the *depôts* were formed, and in addition for the infantry the fourth battalions were raised. Hence the peace establishment of the companies became so weak that the tactical training of the infantry suffered under it. This disadvantage of the French organization is further increased by the fact that a third of the annual recruits only serve for one year, and that these superficially trained men almost exclusively belong to the infantry.

<sup>1</sup> It may be permitted to doubt this, especially as regards the artillery. L'A. M.

## NOTICES OF BOOKS.

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*The Sailor's Pocket Book : a collection of practical Rules, Notes, and Tables ; for the use of the Royal Navy, the Mercantile Marine, and Yacht Squadrons.* By Captain F. G. D. BEDFORD, R.N. 3rd edition, revised and enlarged, 1877. Portsmouth, Griffin & Co. (5½ in. x 4½ in. Weight 15 ozs.) Price 7s. 6d.

SOME dozen years ago in a society of Officers serving on board Her Majesty's ship "Excellent," at Portsmouth, a proposal was made to compile a work, which should be to the Navy what the *Hand-Book for Field Service* was intended to be to the Army. As it happened the project fell through ; we cannot say "unfortunately," since the want of such a book as was contemplated has been more than supplied by the altogether admirable compilation of Captain Bedford. That it has already reached a third edition is an evidence of its merits, which cannot fail to be highly gratifying to its industrious compiler. We will also venture to say, that the fact of two previous editions being exhausted in a comparatively short time, is creditable to the Officers of a service, who, we hope and believe, have been chiefly its users. Not so very long ago there existed on board Her Majesty's ships a wide-spread prejudice against any reference to books for information as to purely professional duties. We have a not indistinct recollection of an Officer serving in an important position, of whom it was darkly hinted in the midshipmen's berth, that he was in the habit of refreshing his memory as to unusual seamanlike operations, by frequent references to the then recent *Manual* of the late Captain Boyd. This proceeding was considered as unbecoming as that of a M. F. H., who might refer to a book on fox-hunting on the occasion of a "check," would be thought in Leicestershire. The memory of Darcy Lever had almost faded from the mind of the rising generation of the day : Griffiths, Liardet, Timmouth, and Martelli had never had a wide circulation in the Navy ; whilst Nares and Alston had yet to come before the naval public. The vast extension of duties and acquirements expected from the Naval Officers of to-day was only just beginning to come into existence. Even until quite lately many Officers considered consulting a book on seamanship a kind of impropriety. We can say of ourselves that doing so, however seldom, was usually accompanied by a certain feeling of loss of self-respect. Times have now changed. Not even the Admirable Crichton himself could be expected to retain in his head even a fraction of the knowledge in which a good Officer of the day is supposed to be nearly perfect. The appearance of Captain Bedford's book, therefore, a few years ago, was highly opportune ; and we can speak, from practical experience of the use of it, of the great value of even the first edition.

There are one or two points on which we, though not without diffidence, venture to differ from Captain Bedford as to what should be included in a work of the sort. We fully admit the difficulty of maintaining any opinion which may appear adverse to that of an Officer of his known ability and wide practical experience. In the first place, what is the chief requirement of a *Pocket-book* ? Surely that it should be handy and portable. Now, we take it that the work under review might, very easily, be made much more of both than it is at present. In these respects it does not compare favourably with the kindred book of Sir Garnet Wolseley, which has also reached a third edition. Captain Bedford himself says (preface to first edition, page ix), "that it threatened to assume the proportions of a *Nautical Cyclopaedia* ;" and we think it a pity that he was not more resolute in reducing its bulk. Perhaps he will accept a few suggestions for the future editions, to which we very sincerely hope it will run. We hardly like to quarrel with the type. Eyes that have been keenly looking to windward all day, or peering through a glass at signals, will hardly bear to be tortured by small print. But a considerable amount of margin might be excised ; blank pages might be reduced in number materially ; and the paper might be thinner and yet equally strong. Material something of the same kind.

as that Mr. Bellows' beautiful little French and English dictionary is printed on, might surely be obtainable at a not prohibitive increase to the cost of the book. As long as it retains the name of pocket-book, its shape might advantageously be modified. The *Soldier's Pocket-book* can certainly be put into most pockets; so can Molesworth's *Engineer's Pocket-book*; the book we are noticing not at all or not conveniently. Some of the printed matter might be sacrificed without impairing the value of the compilation. Lightness and handiness being important objects, why retain more than one preface? Advertisements should be rigorously excluded. Some of the opening remarks to the various sections might be judiciously curtailed and other paragraphs also; e.g., p. 67, last paragraph; the greater part of pp. 156, 157, 158, 159, which might be much compressed; p. 167, second paragraph; p. 175, second paragraph; p. 193, first paragraph; p. 287 entire and the greater part of p. 288, not to mention more. It is a question we should say worth considering if some better mode of binding could not be devised. The damp sea air plays havoc with the binding of any book frequently used. The deplorable condition of most boat signal books after a little use, however carefully kept, must have struck everyone who has seen them. The whole of the book is—with the exceptions noted—so highly practical that we have had the less hesitation in making these, we hope equally practical, suggestions. The mass of information it contains is almost marvellous, and the care and skill which must have directed its compilation are beyond all praise. We confess we should like to have found some information on the subjects to which an Officer's attention is now so frequently turned. A few short maxims for the use of people employed in preparing and manipulating torpedoes would surely have been acceptable; also certain hints for preparing for action. A few suggestions as to the methods of coaling ship and the preparations for that unpleasant operation would hardly have come amiss. At all events we believe that any one of these things would have been at least as practically useful as the greater part of Section VII, which chiefly concerns soldiers who can find out all about it for themselves in Sir G. Wolseley's book, to which,—in spite of the length of the section—even sailors are referred. A few minor errors have struck us, which we note rather as evidence of the careful examination we have given to the book than with a view to fault-finding. The French for "boom" is not *borne* (p. 408), but *bout-dehors* and *baton*: "*Attention aux bouts dehors!*" is "Stand by the booms!" Boatswain is *contre-maitre* or *maitre de manœuvre*. Is not a "boy" in Spanish *Muchacho*, and on board ship *Mozo*? Surely *grelin* is grapnel-rope, and *aussière* hawser; we can answer for the occasional use of them. "*A dieu va!*" for "*Helm's alee!*" has long disappeared from the French Navy and been superseded by "*Envoyez!*" That only a few mistakes, and those of the above trivial kind, appear to exist in a work so filled with varied information, is in itself very remarkable and redounds immensely to the credit of the book. It is suited, as its title-page states, not only for the Royal Navy, but for the Merchant Service and for yachtsmen. A more valuable addition to a nautical library it would be difficult to imagine. We hope it may be found in the possession of every Naval Officer. To those who do not know it we cordially recommend it; and we shall be glad to hear that it has gone to another edition.

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*Le Fond de la Mer.* Par LÉON RENARD. 3rd edition. Paris: J. Hetzel and Co. (7½ in. × 4½ in. Weight 15 ozs.) Price 3s.

M. LÉON RENARD, the author of the above-named work, is librarian of the dépôt of charts and plans in the Ministry of Marine in Paris. His occupation would naturally bring under his notice many facts connected with hydrography and the physical geography of the sea. He has produced an agreeably written little book, and one that can hardly fail to be interesting to the Officers of the Navy. The chief interest of it, however, consists in its containing a section devoted to the history of submarine warfare. The tactics of the torpedo promise to play such an important part in maritime war that anything concerning that terrible weapon is pretty sure to command attention. M. Renard's account of it is solely historical; but the place it has

assumed amongst the appliances for both attack and defence is now so assured, that an historical sketch of the various phases of its developments will hardly fail to repay perusal. The section entitled *La Guerre sous l'Eau* is placed at the end of the work, and we shall reserve our notice of it until we have remarked upon the other matter which precedes it. There is no date upon the title-page, and we find that the author, who sticks pretty closely to his text, and deals almost exclusively with what exists and takes place below the surface of the water, makes no allusion to the labours of Carpenter, Wyville Thomson, and other recent submarine explorers. So far, therefore, as concerns submarine zoology and the physical history of the ocean bed the information is not very full; but, as the book does not profess to be scientific, but chiefly historical and retrospective, its interest is not much impaired by such being the case. The volume is divided into five parts—The Domain of the Blue Water; Science; The Ocean's Casket; Maritime Agriculture; and Subaqueous Warfare. The second and the fifth sections are those which concern naval readers most. The former of these begins with a history of charts and chart-making. He tells us that:—

"The first charts made use of by navigators were very elementary; properly speaking, they were but ordinary maps. Then by degrees seamen came to trace charts of the sea and its coasts, which at first were very rude. The oldest specimen of the kind is the Atlas of Pietro Vesconte, of Genoa, printed at Venice in 1318. The Venetians were then bold navigators. Passing into the hands of the Portuguese, of the Spaniards, of the Dutch, and of the English, 'the sceptre of the seas' became also a magician's wand which produced those old track-charts, those venerable sailing directions, which for seamen now are only interesting curiosities. To France, with its theoretical genius, belongs the honour of having brought these useful labours under the control of science, and Nicholas Bellin may be considered the first hydrographer who imparted a really scientific method into the drawing of maritime charts." (Pp. 45-6.)

At his instigation the Depot de la Marine, the department to which M. Renard is attached, was founded in 1720, and was the parent of the present hydrographical establishment of the French Navy.

In Chapter IV he gives us a curious account of the ravages made upon the great dykes raised by the Dutch to keep out the waters of the ocean, by that pestilent submarine animal the *teredo*. Nothing wooden appears able to resist it. With a remarkable instinct it bores its way in the direction of the fibre of the wood, and is thus enabled to advance with formidable rapidity. The history of its devastations in Holland begins in the year 1730. The dyke of West Kappelle and the port of Medemblik, in Zeeland, were threatened with destruction, and damage was done in other parts. These destructive animals did much injury again in 1730, 1731, and 1732. In 1770 they again made their appearance in Zeeland, and in 1827 in Northern Brabant. In 1833 they seriously damaged the gates at Willemssluis. Up to 1857 their ravages ceased, but in 1858 their action was found to be as violent as ever, and it is to be feared that they are still at work unnoticed. Many kinds of protection were devised, but in vain. Nature, however, came to the rescue. A small annelid, *Lycoris fucata*, takes up its position in the tunnels bored by the teredos, and devours the latter in large numbers. We must not, however, M. Renard warns us, be too hard on these persistent destroyers of wood. It is true they perforate ships and the piles of dykes, but at the same time they protect both; for if the remains of wrecks continued to exist under water in large masses, entrances to ports would be often filled up. "This indefatigable mollusc becomes, then, a member of the 'police of the sea, which he sweeps and cleans.'"

Under the head of divers our author tells us some rather astounding stories. Pausanias, it seems, affirms that the celebrated diver Scyllis of Seyone was able to proceed 80 stadia under water. A Spaniard, Francisco de la Vega, passed the five years from 1674 to 1679 at the bottom of the water, living on fish. M. Renard tells us that in reality the maximum time a human being can remain beneath the water is not above two minutes. The apparatus which enables divers to descend and work under water is older probably than is usually imagined. Alexander the Great employed men who made use of machines which enabled them to walk beneath the surface. Aristotle speaks of an instrument, which he likens to the trunk of an

elephant, that was used by divers to receive a supply of air. In the translation of a Latin book on military and naval affairs published in Paris in the sixteenth century, are to be seen several designs of diving engines. One represents a man completely enveloped in a particular dress, with only one opening in front which is carefully sewn up. A large vase, shaped like a Florence flask, is applied to his mouth to assist breathing beneath the water. The submarine boat used by Bushnell and Fulton, the early American inventors of torpedoes, to which the latter gave the name of "Nautilus," was known in some form to the Venetians as far back as 1559. In that year they employed one to raise a galleon sunk in the road of Malamocco.

So much has been recently published of the submarine boats of Bushnell and Fulton that an account of them here will be hardly necessary.

We may conclude our notice of M. Renard's by translating his accounts of some much more modern ones. The "Ictineo," invented by Senor Narciso Monturiol, of Barcelona, has been tried more than sixty times. It manœuvres more than fifty feet under water as easily as on the surface. When the supply of oxygen fails an apparatus produces it in the right proportion. A crew of ten men have remained in this boat under water for five hours without communicating with the upper air. The craft is armed with guns, and has besides a powerful appliance for piercing the hulls of ships deep down. The "Plongeur," invented by Rear-Admiral Bourgeois, appears to have almost solved the problem of submarine navigation. It is built in the form of a cigar, slightly flattened on a third of its circumference. Astern it has a screw-propeller, and one vertical and two horizontal rudders, which serve to immerse and to raise the vessel to the surface. In one compartment is a machine, worked by compressed air, of 80 horse-power. In another this air, compressed to twelve atmospheres, is stored in tube-shaped reservoirs. Above these compartments are others to receive the water used as ballast for the vessel and to aid its immersion. Special appliances are fitted to free the upper casing, in case of accident, and thus provide a lifeboat for the crew, which numbers twelve men. A series of experiments were made with this boat in 1863 on the Charente, at Rochefort, and in the open sea. Some further improvements were considered necessary; but our author may be right in stating that Admiral Bourgeois has shown the only road which, for this species of navigation, has a chance of leading to success.

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*L'Année Maritime, Revue des Evénements et Répertoire Statistique annuel des faits qui se sont accomplis dans les Marines Française et Etrangères. Première année 1876. Paris, 1877. (Weight, bound, 1 lb. 8 oz.) Price 3s. 6d.*

We doubt if it will be possible for any British Naval Officer, who has the honour and interests of the country and of his service at heart, to rise from the perusal of this useful and interesting compilation without a feeling akin to shame that there is no such work, nor anything like it, published in this country. How is it that in France—which we are never tired of designating a thoroughly *military nation*—writers, publishers, and readers can be found for such a book, whilst in the naval country *par excellence* a record of even the ephemeral notices of naval affairs in the daily journals can only be found by retranslating back into English pages of French, German, or Italian reviews? The importance of rendering ourselves acquainted with what is doing, and has been done in the navies of foreign States, is so self-evident that it seems almost a waste of time to give it even a passing allusion. In military affairs the importance of thus doing has been some time acknowledged, and the acknowledgment has been acted upon. But in addition to the practical necessity of carefully watching the proceedings of contemporary naval powers, there is another thing which should impel us to pay more attention, to show that we pay more attention at all events, to what is going on in the naval world around us. Call it a mere feeling, a sentiment, what you will; but the British Navy should not scorn the behest conveyed in "*noblesse oblige*." No Officer in the service who has fallen in with those of foreign ships can have failed to note the deferential anxiety with which they watch for opportunities of observing our practices, and for the bestowal of our approval on their own Navy. It is only necessary to go to the library of our



INSTITUTION, and take up any one of the numerous foreign reviews above spoken of, to see how careful the writers in them are to furnish their readers with information concerning the English service. This unquestioned, this spontaneously ceded primacy of our own Navy ought, of a surety, to induce its Officers to take the lead in acquiring information, as they have in so many other branches of the naval art.

What is thought, in "un-nautical" France, of the propriety of observing the progress of events in the navies of other nations will be seen from the following extract from the introduction to the volume under review:—

"At the present day a lively interest is taken, and with reason, in everything that concerns the military forces of different countries. Numerous journals and special reviews keep the public informed of the condition of armies.

"A much smaller number are concerned with that of navies. Nevertheless, the necessity of being informed as to what is done abroad is no less imperative for the sea forces than for the land forces. These two elements of the national strength have a close connexion, and their action is often exercised in common.

"Since the substitution of steam for sail-power, especially since the appearance of ironclad vessels, improvements and changes succeed each other with such rapidity that every State careful of its maritime power is bound to keep itself informed of the smallest reforms introduced of the least important inventions appearing in other navies. For it is especially in the matter of the naval art that we can say with truth, that science is the result of comparison and the fruit of well-made selection.

"At the present time professional instruction no longer alone suffices. No doubt it has still preserved, and will continue to preserve, its immense importance; but success is reserved to him who to the perfect mastery of his profession as a seaman shall add an exact acquaintance with the forces and resources of his adversary." (Introduction, pp. v, vi.)

We have not sufficient space at our command to do more than indicate in brief outline what will be found by any naval reader, who cares to consult it, in this valuable and opportunely published volume. The book is divided into seven chapters which deal with general questions of naval policy, and special ones of organization, recruiting, and armament. A great part of the work is statistical, and of its information much will be no less durable than interesting. A fair portion of it may be called historical, and tells us what has been done during the past year, or up to the present time, in the forces of many countries. The list of these is long, beginning with France and ending with Chili. A mere glance at the table of contents at the end, and but a hurried turning over of the pages, will easily show us that the book under review does for us in naval affairs what the *Statesman's Year-Book* does in a more general way. Thus section iv of Chapter IV is devoted to the consideration of torpedoes; the various kinds are noted and described, and accounts of the later experiments in several countries are given. That the book is not a mere collection of figures and statistics, but that its pages display a power of taking a large view of facts, and the possession by the writers of a fair share of critical acumen, may be seen in this account of the Turkish Navy under the heading *Organisation Générale*. "Taking into consideration its effective *matériel* alone the Turkish Navy should be put in the third place, next to that of France, among the maritime powers of Europe. But its *personnel*, especially the 'executive' officers, is far from being up to the level of its superb ironclad ships. The disproportion existing between these two elements is explained by the kind of artistic caprice that the late Sultan [Abdul-Azzis] had for these majestic engines of war. He liked, they tell us, from the elevated position of his balcony, to watch these immense masses performing evolutions and exercising at general quarters while vomiting fire and smoke." . . . "The Turkish Navy, however, is in possession of an organization which might put to shame many maritime powers" (p. 68). This is followed by a short account of the administration and divisions of the service.

The *Année Maritime*, handy in shape and size, and low in price, will be found interesting to others than naval Officers. A whole chapter is devoted to a notice of the points which concern the merchant service. The view taken of that of France is gloomy in the extreme, and one section, which is worth reading (see p. 421) begins with the sentence, "La Marine Marchande de la France est en complète décadence."



The economical views held by the writer of the section are not likely to find ready acceptance in this country, but they at least deserve a careful perusal, and we recommend them, as, indeed, we do the whole book, to all who are interested in the maintenance of our own Navy at its proper strength, and in keeping up behind it a suitable reserve. We ought not to omit to state that the book ends with a list of publications on naval affairs, so that facilities are given to those who wish to discover what has been published on like subjects during the year to procure what they desire. We hope that the editors of the *Année* will receive sufficient encouragement to induce them to continue the publication for subsequent years.

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*Les Navires de Guerre les plus récents.* Par M. MARCHAL, Ingénieur des Constructions Navales (*Extrait de la REVUE MARITIME ET COLONIALE*). Paris, 1876. (Weight, paper covers, 6 oz. ; 3s. 6d.)

M. MARCHAL has published in a separate form papers on the newer types of war vessels, both armoured and unarmoured, contributed by him to that excellent publication the *Revue Maritime*. The work contains not merely a descriptive account of the various vessels which have been added to the national navies of the chief European and American countries during a dozen years or so, but also a concise and clearly written criticism of the different classes. The lion's share of the book falls to our own Navy; indeed the section devoted to the unarmoured cruisers deals exclusively with British vessels, but the most striking of the designs for ironclads built for other Governments both in this country and abroad receive full and careful notice. Without doubt much of the information on modern warship-building which M. Marchal gives us is to be found in English publications; his pages indeed frequently end in footnotes containing references to English authorities; but—not to speak of his criticisms—we have in his book a compact and succinct account of the chief factors in the fighting power of maritime nations which no one else has given us. The work is of course not equal to the elaborate and pleasantly written description of *Our Ironclad Navy*, which we owe to the pen of Mr. Reed; but that book, unfortunately, was published some years before the more splendid vessels of the latest type had been called into existence, and was devoted solely—as its name implies—to the consideration of our English vessels. M. Marchal's production brings home to us very forcibly the want which, naval officers in our own service so often experience, of compact information on naval affairs. If an officer who has the time to read—and who that is serving afloat can have it?—and can afford to buy all the many periodicals, weekly, and daily journals, published in London, Paris, and Berlin, which devote some portion of their space to naval matters, were diligently to note and collect all the items of intelligence on that head, he might find himself about as well off for information as the French or Austrian officer who, half-a-dozen times or so a-year, receives free a copy of the *Revue Maritime*, or the *Mittheilungen aus dem Gebiete des See-wesens*, edited and published at Government expense. It is therefore incumbent on officers, whose time or means are insufficient to permit their wading through "files" of the *Engineer* or the *Pall Mall Gazette*, to re-translate into their own tongue the summaries at the end of the periodicals which the Governments of most continental nations are careful to publish; we have said, "it is incumbent" on them, we mean, of course, upon those officers, fortunately a large majority, who desire to study the more important questions connected with their profession.

The book before us extends to little more than 120 octavo pages, but it contains over thirty very neatly executed and apparently accurate figures, and three elaborate tabular statements. On the first page we find what the author calls, an "*étude comparative*" of the ironclads of the world, and of the English unarmoured ships. This study is comprised chiefly in a summary of the various kinds of vessels classified on what we may accept as a distinctly scientific principle. What that principle is will best appear from the following extract:—

"The ideas which at the present day govern the conception of ironclads began to appear in 1866, when were laid the keels of the 'Hercules,' the 'Monarch,' and a

"short time afterwards, the 'Cerberus.' These three ships may be taken as the heads of three very distinct classes of vessels:

"I. Ironclads with a battery;

"II. Masted ironclad turret-ships;

"III. Non-masted ironclads.

"This division we shall adopt rather than make a special class of the turret-ships, which would necessitate assimilating the 'Monarch' to the 'Glatton,' and placing the 'Hotspur' amongst the ships with batteries." (p. 3).

These three chief classes are subdivided into smaller divisions, and the typical ship of each of the latter is considered at length in the body of the work. To follow M. Marchal in his descriptions and criticisms would be to go far beyond what anything like a due regard to our space would permit. We shall content ourselves with saying, that he is careful to support his statements by references to recognised authorities, and that his remarks are clearly made, and his opinions seem to have been arrived at only after mature consideration. When he speaks, he does so with the authority of a man who is discussing a subject with which he has a special and professional acquaintance. It will be at once perceived that this book is worthy of attention. A calm and deliberate examination of recent designs for war-ships by a professional expert, in anything approaching a comprehensive form, is a thing for which in our own country we fear we may look in vain. Various polemical works on the merits and faults of special types have indeed appeared, but they belong to a not particularly interesting or valuable class of literature, and have certainly not added much to our means of carefully studying questions of construction. We recommend this book to the attention of members of our INSTITUTION—we may mention that it has been added to the library—as we are confident that they will find it a compact and useful hand-book of Modern Naval Architectural Designs. Perhaps it is too much to hope, but we own that we should like to see some Officer—not afraid of being stigmatised, by a common misuse of adjectives, as "scientific"—take in hand a translation of it, and to hear that it had found its way on board most of the ships of Her Majesty's Navy.

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*A History of Cavalry from the Earliest Times, with Lessons for the Future.* By Lieut.-Colonel GEORGE T. DENISON, commanding the Governor-General's Body Guard, Canada. London, Macmillan and Co., 1877. Price 18s. Size 9 in. x 6½ in. x 1½ in. Pp. 567. Weight 2 lbs. 9 oz.

IN the year 1874, the Grand Duke Nicholas, Inspector-General of the Russian cavalry, having had his attention drawn to the incompleteness of any existing work on the special history of cavalry, offered three prizes for the three best treatises on the history of that service. The competition was thrown open to the Officers of all foreign armies; and Lieut.-Colonel Denison, who, we believe, was the only British Officer who competed, has in the work with the above title submitted to the criticism of the public the treatise he sent in.

Lieut.-Colonel Denison is an enthusiastic and painstaking writer on cavalry matters, and is already known as the author of a work on "Modern Cavalry," which, if it does not display much originality of idea, throws some light upon the employment of cavalry, and especially upon the use made of that arm for dismounted service during the American Civil War.

The "History of Cavalry," with which we now have to deal, shows evident signs of very great pains and research on the part of the author; indeed, most readers will probably think that Lieut.-Colonel Denison has displayed almost an excess of the latter quality, as he carries us back to the state of cavalry among the Egyptians, Scythians, Assyrians, Persians, &c., and so brings us through the classical and middle ages to an account of modern cavalry. It is but fair, however, to the author to say, that he was considerably tied down by the conditions of the programme issued, which gave a synopsis of the different headings to be adhered to in the composition of the treatises sent in by competitors for the prizes. According to this programme, the history of cavalry was to be treated under five distinct periods, viz. :—

- 1st period. That of the Greek and Roman armies.  
 2nd " From the fall of the Western Empire to the invention and introduction of fire-arms.  
 3rd " From the introduction of fire-arms to Frederick the Great.  
 4th " From Frederick the Great till the introduction of rifled fire-arms.  
 5th " From the introduction of rifled fire-arms to the present time.

Even the conditions of this programme, however, do not appear to have necessitated an elaborate dissertation on the "origin of wars," or on the first causes of strife among a human society which "commenced practically by a group of families;" nor was it requisite to discuss the "use of chariots in the Trojan War," or the employment of the same vehicles by Pharaoh during the "exodus of the Children of Israel from Egypt." In fact, we must protest against the practice, too common in many tactical works and dissertations of the present day—especially perhaps on the subject of cavalry—of carrying the reader's ideas back to the days of the old Egyptian and Assyrian monarchies, and attempting to base our notions of modern warfare upon Scriptural texts. The way in which men fought on horse or foot in those remote ages may be of interest to the antiquarian, but can convey absolutely no practically instructive lessons to the military student of the present day. All such writing must be set down by any practical man as pure pedantry, or at best as mere "padding" to fill the book or the lecture.

Passing by, therefore, with the above brief remarks, the earlier chapters of Lieut.-Colonel Denison's book, we shall commence our examination of his history of cavalry at the era of Frederick the Great, the age at which the modern use of cavalry may be said to commence. Charles the XIIth and Maurice de Saxe—the one by his impetuous energy, the other by his writings—were no doubt the forerunners of Frederick in the reforms he introduced in cavalry; and their example and ideas must probably, as Lieut.-Colonel Denison remarks, have had a very marked influence upon him. But Frederick was the first who practically withdrew cavalry from the false position which it had occupied since the introduction of fire-arms.

The author gives a very clear and good account of the numerous improvements made by Frederick in his cavalry. He strictly prohibited the use of fire-arms mounted, and taught his cavalry to rely on their swords and the speed of the charge alone; he insisted upon the utmost rapidity in manœuvring; in tactical formations he employed his cavalry in large masses, and to him is due the introduction of horse artillery. The great stress laid by Lieut.-Colonel Denison on the advantage gained by the disuse of fire-arms when mounted is somewhat curious, as in a later part of his book he himself advocates the use of a revolver by cavalry when charging in place of the sword. He dwells strongly on the able support given to Frederick by Seydlitz and Ziethen, and on the high state of efficiency to which the Prussian cavalry was brought by their united efforts. In fact, the majority of Frederick's victories were won by the successful use of this arm; and perhaps at no time has the use of cavalry on the actual battle-field had such general and extensive results as under Frederick. The attention paid by him to individual horsemanship and skill in the use of the sword had the greater effect as other nations at that time had hardly turned their attention to these points.

But still, as Lieut.-Colonel Denison well points out, there was a weak point in Frederick's cavalry. The great attention bestowed on making them effective in manœuvring and charging in large masses on the field caused less care to be taken in training them fully in reconnoitring and outpost duties. The superiority of the Austrian irregular cavalry in these services often placed Frederick's armies in dangerous and even desperate situations, owing to sudden surprises from the enemy and the want of information as to the latter's movements. It is remarkable that in the war of 1866 the conditions of the two hostile armies in this respect should have been so completely reversed. Frederick's cavalry was mainly trained to hand-to-hand encounter in large masses on the battle-field; in this work its pre-eminence was undoubted; but the author truly urges that in the performance of detached duties it was greatly inferior to its Austrian opponents. The two chapters on the Prussian and Austrian cavalry at the time of Frederick the Great are by no means the least interesting parts of Lieut.-Colonel Denison's book.

The successes of the Prussian cavalry were so striking that the cavalry of nearly

all other European armies was modelled on the Prussian principle. But the changes introduced were in many cases (though perhaps less notably than in regard to the infantry) a mere servile imitation of the details of Frederick's system; the spirit was lost sight of in the letter.

After giving a brief account of the condition of the Russian cavalry during the latter part of the 18th century, Lieut.-Colonel Denison proceeds to consider the action of cavalry during the wars of the French Revolution. As a rule, the Prussian cavalry—or rather perhaps its leaders—deteriorated after Frederick's death, and the cavalry did not greatly distinguish itself during the Revolutionary Wars. The author observes that in these wars no great victories were won by the charge of large masses of horsemen, as so often happened under Frederick the Great. At the same time the cavalry of the Allied Powers proved themselves greatly superior in desultory actions to that of the French Revolutionary armies. The battle of Würzburg, in 1796, is noticed as being the first general action in the Revolutionary Wars in which cavalry were employed in large bodies, and exercised an important influence on the general result of an action.

It was left, Lieut.-Colonel Denison says, to Napoleon to perfect the method of using cavalry by employing it skilfully in every phase of its duty, for he knew how to use it in covering the movements of his army in a campaign, in making decisive charges in action, in following up successes, and in covering retreats. His cavalry were never, however, so perfectly trained to manœuvre at speed as the Prussian cavalry under Frederick, partly, perhaps, as Lieut.-Colonel Denison remarks, because Napoleon had not the time or inclination to devote the same personal attention to this branch of the service that Frederick constantly bestowed upon it, but still more, we should be inclined to say, because the French as a nation are not naturally good horsemen. In what, however, may be called the strategical employment of cavalry—such as screening the movements of an army and obtaining information of an enemy's movements—Napoleon was greatly superior to Frederick. In the tactical employment of cavalry on the battle-field, his great principle was to form it in large masses and to use it on the decisive points of the action; such masses, though not possessing the manœuvring power of Frederick the Great's cavalry, were successful by the mere force of numbers and impetuosity. Lieut.-Colonel Denison, however, hardly seems to call sufficient attention to the fact that this massing of cavalry, particularly in Napoleon's later campaigns, was carried to an undue extent; the enormous masses from their size became unwieldy. We are also disposed to think that, in the high eulogium which the author passes upon Napoleon's management of cavalry, he somewhat underrates the services rendered to their chief by men like Murat, Kellerman, Bessières, Lasalle, &c., who, though not equal to Seydlitz or Ziethen, were still brilliant cavalry leaders, and to whose exertions, both on the battle-field and on detached service, some of Napoleon's most decided successes were in great part due. On the other hand, Lieut.-Colonel Denison, with justice, draws particular attention to the brilliant use made by Napoleon of his cavalry in following up a success and preventing a defeated enemy from rallying; and, as a striking instance of this, he gives an account of the untiring pursuit of the Prussians after the victory of Jena. Napoleon's cavalry was certainly superior to that of either the Austrians or Prussians, though not equal to the English cavalry, to whose achievements in the Peninsula (notably at Salamanca) and at Waterloo Lieut.-Colonel Denison points with national pride; and he especially calls attention to the excellence of the King's German Legion, as evinced not only by their performance of outpost duty, but also by their gallantry in action, during the Peninsular War.

The nature of Lieut.-Colonel Denison's subject, no less than the conditions of his programme, necessarily lead him to pay particular attention to the Russian cavalry; and he devotes the greater part of an interesting chapter to a consideration of the performances of the Cossacks in the campaigns in which the Russian armies were opposed to Napoleon. He observes that the services of the Cossacks in the campaign of Eylau led to the first serious check which Napoleon received by being obliged to retreat after a pitched battle; and he dwells at some length upon the difficulties and dangers caused to the French armies by the partisan warfare carried on by these hordes of irregular horsemen, both during the disastrous retreat from Moscow and in the campaign of 1813 in Germany. While fully admitting, how-

ever, that the harassing mode of warfare carried on by the Russian irregular cavalry was one of the main causes of the disasters of the French Army in the retreat from Moscow, and contributed also in a considerable degree to the successes of the Allies in the campaigns of 1813, we can scarcely go so far as to say with Lieut.-Colonel Denison that "to the services rendered by that force (the Cossacks) may be attributed the fall of the most powerful military empire since that of Rome." Many other causes were at work to contribute to the fall of the Napoleonic empire; and when the author of a history of cavalry expressly makes such an assertion, it is difficult to avoid the conclusion that he remembered he was an actor playing to a Russian gallery.

There is not much of novelty in what Lieut.-Colonel Denison tells us of the history of cavalry from the time of Frederick the Great to that of Napoleon; but his account has the merit of putting into a connected shape a mass of information derived from numerous different sources, and he appears generally to have made a judicious selection from the criticisms of recognised military authorities. It is in the latter part of his historical account, as he comes nearer the present day, that his own personal theories are brought more and more prominently into the foreground.

From the time of Waterloo until the Crimean War there was little change in the system of cavalry operations. Lieut.-Colonel Denison points to the Polish insurrection of 1830-1831 as one of the most striking instances during this period of the use of cavalry on a large scale, and as illustrating the employment of cavalry raids much similar to those of the American Civil War. He also refers to the great use made of cavalry in our own wars in India, and draws attention to the fact that the greatly superior masses of that arm generally possessed by the native armies often prevented the English troops, even after complete victories in the field, from gaining the full advantage of their successes.

The fifth section of the book deals with the period from the introduction of rifled fire-arms to the present day. The first war in which rifled fire-arms were generally used was that of the Crimea, but Lieut.-Colonel Denison considers that this war could not, from its character, throw much light upon the question as to how far rifled arms would affect the employment of cavalry against infantry. Lieut.-Colonel Denison even considers that the action of Balaklava teaches little to the cavalry Officer; but in this we must differ from him. Though the engagement may convey little *positive* instruction, it teaches much in the *negative* form of warnings as to what faults to avoid in the action of cavalry against cavalry or artillery—warnings which were seriously taken to heart by the cavalry authorities of more than one European nation. The cavalry outpost service and reconnoitring duties on both sides during the Crimean War were also shown, as the author remarks, to be lamentably inefficient, as the numerous surprises proved. During forty years of peace the drill of the parade-ground had superseded instruction for the practical business of war. Here again a lesson was taught, the value of which was first realised, not by the nations engaged in the war, but by Prussia.

In the Italian campaign of 1859 cavalry did not play any important part, chiefly owing to the nature of the country, which is unsuited for the action of mounted troops; but also probably owing to the moral effect produced by the introduction of rifled arms, which induced a hesitation in exposing cavalry in masses to the fire of infantry armed with the long-range rifle. In fact, at this time one of those constantly recurring epochs appears to have been reached in the history of military tactics, when military opinion as to the respective value of the different arms gradually—or perhaps even suddenly—veers round, and is carried away blindly to exaggerated depreciation of one particular arm. As Lieut.-Colonel Denison remarks, at this period after the Italian campaign of 1859, and in consequence of the deadly effect of the new rifles, the opinion became almost general that the days of cavalry were numbered, and that the force would have to be abolished altogether, or at least greatly reduced. And this feeling led to considerable modifications being made in the cavalry of the chief European armies. The principal change, to which Lieut.-Colonel Denison hardly calls sufficient attention, was the diminution in the proportion of heavy cavalry to light; and it is somewhat curious that an English historian should not have noticed the change made at this period in the classification of our own cavalry into "heavy," "medium," and "light," the reduction in the number of

heavy cavalry regiments, and the abolition of the old "Light Dragoons." In fact, he appears to pass over entirely the changes in the organization of our cavalry forced upon us by the Indian Mutiny, which to a student of English cavalry history would certainly have been a matter of interest.

It was reserved mainly for the Civil War in America to prove that the value of cavalry had not yet passed away, and that even if—as general opinion at the time seemed to think—mounted troops could no longer be employed in masses on the battle-field, other spheres of action were still open to cavalry. In this part of his subject Lieut.-Colonel Denison is thoroughly at home, both from his former study of the question and from his means of access to American sources of information. He devotes a long chapter to the subject of the employment of cavalry during the Civil War, and the information he affords is in many respects highly valuable. He states that, whereas at the beginning of the war the idea then generally prevalent of the inutility of cavalry against the new infantry fire-arms was acted upon, and a very small cavalry force was employed on either side, the mistake was soon discovered, so much so that in the latter part of the war the Northern States maintained no less than 80,000 cavalry, almost all mounted riflemen. We have not space to follow the author into the details he gives of the various occasions on which cavalry was employed with success during the American War; we must restrict ourselves to saying that he points almost with enthusiasm to the great advantages derived from the introduction of mounted riflemen, and to the successful effects of partisan warfare, and of cavalry raids, such as those made by Morgan into Kentucky in 1862, by Stuart through Pennsylvania in the same year, by Forrest on various occasions, by Grierson through Mississippi in 1863, by Wilson through Alabama in 1865, and by Sheridan in the same year.

Lieut.-Colonel Denison brings forward the operations of the cavalry, on both sides, during the American War, as proofs, not only of the value of cavalry being able to act on dismounted service (which probably no one at the present day would be found to dispute), but also in favour of his great hobby of mounted riflemen; and, further, as it would appear, in favour of the employment of fire-arms by cavalry mounted against an opposing body of cavalry charging with the sabre. At the same time, Lieutenant-Colonel Denison himself is forced to admit that the contempt for the sword and the high opinion attached to the rifle as a superior weapon for mounted troops were due, in great part, to the long-inherited habitude of the Americans to the use of fire-arms. What Lieut.-Colonel Denison does not mention is, that the American cavalry were almost entirely volunteers and raw recruits, utterly unskilled in the use of the sword or lance, and still more perhaps that the nature of the country was, as a rule, unfavourable to the use of cavalry in masses, while eminently suited to its employment on dismounted service with fire-arms. Suffice it to say that probably no European Officer will be found to advocate the employment of a fire-arm as a weapon for a mounted soldier in opposition to the sword or lance; and that, while attaching the fullest importance to the necessity of training cavalry to act on foot for certain special purposes, the whole conditions of the American War, in regard both to the nature of the troops and to the character of the country, were so different from those which would occur in any war in Europe as to render it most hazardous to found upon it any actual opinion as to the value of mounted riflemen for European armies. At the same time, the lessons of the American War should not be lost upon us, especially in regard to their showing what may be effected by a cavalry, even hastily improvised, if the raw material consists of men accustomed to the use of fire-arms, having a natural aptitude for horsemanship, and, perhaps, above all, possessed of spirited determination and "dash." But we can hardly go so far as to endorse the opinion expressed by Lieut.-Colonel Denison that "the professional cavalry Officer in Europe, wrapt up in the traditions of the wars of Frederick the Great and Napoleon, and holding it as a fixed principle that cavalry relying upon fire-arms are necessarily worthless, has never given the proper weight to the teachings of the American Civil War."

Lieut.-Colonel Denison next proceeds to discuss the employment of cavalry in the Austro-Prussian War of 1866, and in the Franco-German War of 1870-71. The former campaign he treats of very summarily—somewhat too summarily, in our opinion, in regard to a history of the modern development of cavalry. He appears



to be imbued too much with prejudices in favour of the use made of cavalry during the American Civil War, quite forgetting the different conditions under which war must necessarily be waged in the two continents. Nor does the author appear to give sufficient credit to the performances of either the Austrian or the Prussian cavalry during this brief campaign, when he says that the cavalry did not render any valuable services in either army. The Austrian cavalry at least gloriously covered the retreat of their defeated army after Königgrätz, and it is somewhat too much to imply that the Prussian cavalry entirely failed in the proper and effective method of covering the advance of an invading army. It is true that the Prussian cavalry showed deficiencies in some respects (acknowledged by none more freely than by themselves) during the war of 1866, but the defects were hardly so great as Lieut.-Colonel Denison, with his evident American sympathies, would lead us to believe.

But such deficiencies as the experience of the campaign of 1866 proved to exist in the organization and management of their cavalry were promptly remedied by the Prussian military authorities, as was amply proved in the war of 1870-71. As every one knows, the performance of the outpost and reconnoitring duties by the French cavalry in this war was lamentably deficient. On the other hand, Lieut.-Colonel Denison himself passes the highest eulogium on the admirable skill and boldness with which the screening and reconnoitring duties of the Prussian cavalry were performed. Indeed, the praises he bestows on the Prussian cavalry in this respect are in somewhat strange contrast with the depreciatory tone in which he generally speaks of cavalry modelled on the European system of organization and equipment. At the same time the account he gives of several of the battles of the war afford a curious answer to his dogmatic assertion that cavalry are no longer of any use on the battle-field. The French cavalry was often, and the German sometimes, needlessly sacrificed. But at Vionville the charge of the German cavalry upon the French infantry saved Alvensleben's corps from a serious disaster; and both at Amiens and at some of the battles on the Loire cavalry successfully charged both infantry and artillery. Although Lieut.-Colonel Denison admits that such cases may occur, he scarcely seems to allow sufficient importance to them. The main lesson he deduces from the war of 1870-71 is the great superiority of the American mounted riflemen over European cavalry. This deduction is, moreover, apparently based on the popular idea that the Uhlans, who did not at that time carry fire-arms, constituted the whole of the German cavalry, overlooking the fact that the great proportion of the cavalry of the German Armies was composed of dragoons and hussars armed with long-range breech-loading carbines.

With the Franco-German War the historical part of Lieut.-Colonel Denison's work concludes. The last section of his book contains his deductions from former experience as to the best system of organization, equipment, and employment of cavalry in modern warfare. In these deductions we regret that we cannot congratulate the author upon either the soundness or the originality of his views. Where they are sound they are seldom original; where they are original we are often disposed to doubt their soundness.

In a chapter on the organization of cavalry he urges, chiefly from the experiences of the war of 1870-71, that cavalry on the battle-field can in future be of little value, and that the action of cavalry on the battle-field has consequently been very much narrowed. It is no doubt true that the action of cavalry under such circumstances has been narrowed as compared with the rôle it played in the days of Frederick the Great and Napoleon; but the author seems to push his argument considerably too far, and to underrate the influence which cavalry may still possess, if not upon the decisive result of a battle, at least upon particular momentous crises of an action. He appears almost entirely to overlook the fact that cavalry during the course of an engagement may still not only have to protect their own infantry against the threatening attitude of hostile cavalry, but that they may also often by well-timed attacks have opportunities, with little risk to themselves, of charging disorganized infantry, or of suddenly surprising infantry or artillery. He assumes, somewhat dogmatically, that only one-fourth of the mounted force of an army should be of the type of what he himself calls "*cavalry proper*," i.e., cavalry whose duty consists in engaging in hand-to-hand conflict, and boldly charging the enemy. He



then proceeds to consider the best mode of equipping and arming such "cavalry proper;" and here he propounds a theory which, to most cavalry Officers, will sound somewhat extraordinary. He strongly advocates the use of the revolver as the weapon to be employed in place of the sword by a body of cavalry during a charge, more especially against infantry, basing his opinion again on the experience of the American War. As previously pointed out, the exceptional conditions of that war can afford no safe basis for conclusions as to European warfare. The American cavalry on both sides were naturally habituated to the use of fire-arms; they were from their previous habits excellent shots; they knew the deadly effect of the rifle or pistol on foot, and they equally dreaded its effect; at the same time they were not accustomed to and had little experience in the use of the sabre. No wonder, then, that they preferred the use of the pistol to that of the sword. But we doubt whether many English cavalry Officers will subscribe to the doctrine enunciated by Lieut.-Colonel Denison; and we strongly suspect that in such charges as he recommends with the revolver as many men would be put *hors de combat* by their friends as by their foes.

It has been mentioned that Lieut.-Colonel Denison assumes that only one-fourth of the mounted force of any army should be organized as "cavalry proper," and that the remainder should be trained and equipped as "mounted riflemen." It is somewhat difficult to ascertain the exact meaning attached by him to his favourite term "mounted riflemen." If he means a body of infantry mounted upon horses, we must most strongly dissent from his views; the result would be the creation of a mere hybrid force, probably unfitted for the duties of either infantry or cavalry. The system often recommended (although we by no means advocate it) of employing infantry proper conveyed in carriages to accompany cavalry would probably be far preferable to such an organization. If, on the other hand, he means cavalry soldiers trained to act on foot on certain special occasions, and for certain special purposes, it is difficult to see in what respect his proposed mounted riflemen differ from the ordinary cavalry of the line of most European nations. A reference to the cavalry drill-books of the German, French, Italian, and English services would show the author that the duties he proposes for his mounted riflemen are almost exactly those to which the cavalry soldiers (with the exception of cuirassiers and perhaps lancers) of nearly every principal European Army are trained.

On the subject of the armament and equipment of cavalry, the author furnishes us with few suggestions of much interest or novelty; almost every idea he propounds has certainly been considered, and in many cases acted upon, years ago. Nor in regard to the employment of cavalry in a campaign do his deductions from the history of the arm afford us many new ideas. In regard to one point, however, there will probably be general agreement with the author, that European cavalry have not as yet shown such enterprise as was exhibited by the American cavalry during the Civil War. Partisan warfare and cavalry raids into an enemy's country have certainly not of late years been carried out in Europe on the same extensive scale as was done by Stuart, Sheridan, and other distinguished cavalry Generals in America. It is true that the German cavalry during the Franco-German War, especially at the commencement of the campaign, distinguished itself by its boldness and made many a dash against the French communications, destroying telegraphs, railways, &c.; but such inroads into the enemy's territory were carried out on a much less extensive scale than the celebrated cavalry raids of the American Civil War. Here again, however, the difference in the character of the two countries, and the different circumstances of the campaigns may, perhaps, account for the difference in the employment of cavalry in the respective cases. In connection with this subject we may state on good authority—although not mentioned by Lieut.-Colonel Denison—that there was an impression among many German Officers, shared, it is believed, by General Sherman (who was present with the German Army), that if a strong force of cavalry and artillery had been detached after the victory of Sedan, when the Germans determined to march on Paris, it might have passed through the country and paralyzed it before any effective opposition could have been organized. There could hardly have been a better opportunity for attempting in Europe to imitate the example of the extensive raids of the American Civil War.

It certainly seems an omission that in a work devoted to the history of cavalry

the author should have failed to bring prominently to the foreground some of the principal lessons which the experience of the employment of cavalry in recent wars has taught us. Not once, for instance, throughout his work (so far as we have been able to discover) does he refer to the importance of reconnoitring ground in front of an advancing body of cavalry—a principle the non-observance of which has often led many a gallant but incautious squadron to rush on to destruction unawares. He never appears to allude to the system of *éclaireurs*, or scouts, employed for the purpose of examining beforehand ground which cavalry will have to pass over, as distinct from that of reconnoitring parties sent out to a distance to obtain intelligence regarding the enemy. Yet to this system the greatest importance has for a long time been attached in the Prussian service; and its value has at length been tardily recognized by our own cavalry Officers.

Nor does the author in any way discuss the vexed question as to the best organization to adopt for the cavalry force of an Army on a campaign, that is to say, whether the cavalry should be formed in independent corps or divisions acting by themselves, or whether they should be placed at the disposal of the corps or divisional commanders.

Again, though Lieut.-Colonel Denison says that his mounted riflemen should carry among them a few small axes or hatchets, he nowhere makes any distinct reference to the question of equipping a certain proportion of cavalry as pioneers for the special purpose of destroying or repairing roads, railways, telegraphs, &c. Yet this is a subject which has of late attracted much attention in European armies; and without some such equipment, and special instruction in pioneer duties, many of the raids upon an enemy's communications, to which he rightly attaches so much importance, would be to a great extent ineffective. On these and several other interesting practical questions Lieut.-Colonel Denison maintains complete silence; he is content to stake his credit on his favourite idea of "mounted rifle-men."

In criticising this work it would be most unfair not to bear in mind the circumstances under which it was composed; it had to be written to a certain extent under disadvantageous conditions, and according to a programme laid down for the author, not one of his own choice; and this programme appears to have been faithfully kept in view throughout. We have attempted frankly (and we trust not unfairly) to point out what appear to be both the merits and the defects of the work. Its main defect is that it is too evidently the production of an author who has a hobby, and a hobby which he is determined to ride to death. It propounds the dreams of a theorist, not the opinions of a practical cavalry soldier. But the historical portion of the book gives evident proof of much painstaking research, and of very extensive study of the subject: it gives an interesting account of the gradual changes in cavalry tactics, and as such it will always be a useful book of reference in a cavalry Officer's library. And, though we cannot altogether subscribe to the author's inferences as to the employment of cavalry in future wars, we trust that he may earn the well-merited reward of his painstaking labours by being declared a successful competitor for one of the prizes offered by the Grand Duke Nicholas.

In conclusion we venture to offer one or two suggestions which we believe might lead to useful improvements in the work in case of a second edition being called for.

To students of cavalry history it would be a great assistance if there were added to the work some sort of tabular statement giving in a concise form a chronological summary of the chief changes introduced in the general organization, armament, and tactics of cavalry, at least from the era of Frederick the Great. At present, without a careful perusal of each chapter, and a study of the numerous illustrations introduced from different campaigns, it is almost impossible to obtain a clear idea of the chronological order of the successive changes which have brought European cavalry to its present state as compared with what it was 150 years ago.

It would also, we venture to think, be a valuable addition to the work to print as an appendix to it the programme issued by the Russian authorities, showing the various headings under which the competitors for the prizes were required to arrange their treatises, as this programme both gives a brief general synopsis of the history of

cavalry, and also contains a very valuable list of works to be consulted on the subject. But we would further suggest that to the list given in the programme there should be added the titles of several important works on cavalry in German, French, Italian, and English, which are not mentioned in the programme; while, on the other hand, many of those referred to are written in Russian, and can, therefore, only be consulted by the few who are acquainted with that language. A catalogue of this kind would be a most valuable addition to cavalry literature, and could, we feel sure, be compiled without much labour by one who has spent so much research on the subject as the author of the "History of Cavalry."

J. W. H.

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*Great Campaigns: a Succinct Account of the Principal Military Operations which have taken place in Europe from 1796 to 1870.* Edited from the Lectures and Writings of the late Major C. Adams, Professor of Military History at the Staff College. By Captain C. COOPER KING. 1 vol. 8vo, illustrated with maps. Blackwood and Sons, 1877. Price 16s. Size 9" x 6½" x 1½". Pp. 620. Weight 2 lbs. 9 oz.

It was due entirely to his own modesty and unassuming character that the late Major Adams did not during his lifetime take his place on an equal level with the most distinguished, not only of English but of European military historians. Well was it said of him by one who, like ourselves, had the privilege of listening to him in the Lecture Hall, "What is the use of studying a campaign after Major Adams has lectured to us upon it; he tells us everything about it, we cannot find out anything more ourselves." But it was not only in grasp of the subject, but it was also in his complete and perfect impartiality that much of his merit as an historian lay. A long and severe illness followed by a premature death deprived Major Adams of the chance of becoming known to the English public generally.

Those who were associated with him, or who knew his worth, will turn eagerly to this work; they will find there much that is invaluable, but not much that will remind them of the inexpressible charm that attached itself to the author's utterances. Captain King has done his work well, and has made the most of the materials at his command; but it is evident that these materials are of the most fragmentary description, and that Major Adams' notes were not "left for publication." Any notes by Major Adams on Military History must be worth careful study, but this volume in no way represents the full power and genius of that gifted critic.

H.

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*Manual for Regimental Transport (Infantry).* Official Pamphlet. Price 3d. Size 4½" x 3¼". Pp. 43.

THIS little pamphlet contains so much valuable and detailed information on the subject of which it treats that any infantry Officer who masters it will find little difficulty in efficiently supervising the regimental transport of his battalion.

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*The Duties of the General Staff.* By Major-General BROMSART VON SCHELLENDORF, Chief of the General Staff of the Guard Corps. Translated from the German by W. A. H. Hare, Lieutenant Royal Engineers. Vol. I. London: C. Kegan Paul and Co. 1877. Price 10s. 6d. Size 8½ in. x 5½ in. x 1 in. Pp. 303. Weight 1 lb. 9 oz.

HOWEVER much the study of languages by Officers in the Army has increased in the last few years, German, and especially military technical German, is a sealed book to many, and Lieutenant Hare has done a welcome service in translating this book, and thus rendering it accessible to the Army generally.

General von Schellendorf's work is of a comprehensive character. In the first chapter, entitled "General Description," the author points out very clearly that in former days armies were small, and movements and formations were according to

fixed and rigid regulations, and consequently the need for highly-trained Staff Officers did not exist, whereas under the requirements of modern warfare a General must, so to speak, multiply himself over and over again, if he would have his plans and ideas converted into action. This he can do only by substituting trustworthy agents for his personal government. The author's views of the position of a Staff Officer as regards the General, and of the study required from Staff Officers *after* they have reached their elevation to the Staff, are worthy of careful perusal.

The second chapter is of a more technical character, and deals with the organisation of the General Staff, not only of Germany, but of other European countries. The efficiency of the German Staff is, in the author's opinion, due mainly "to the independent position in the organization of the Army which the Prussian General Staff has gradually attained, the possibility of entering the corps, which is restricted to no clearly defined classes, the most complete freedom in military scientific training, watched over only by the very highest Generals, and, finally, the compulsory return of General Staff Officers from time to time to regimental duty."

It is also interesting to notice how in the earlier days of Staff history a close connection existed between the Staff and the corps of Engineers, which was dissolved when Officers not belonging to the Engineers had been trained to perform Staff duties.

The third and fourth chapters explain the peace formation, commands, and administration of the Prussian or German Army, and the system of recruiting in time of peace. In the fifth chapter are described the office duties of the Staff. Chapters six and seven will be to the majority of readers the most interesting in the book. In the first-named we have not only an historical sketch of the development of manoeuvres, but the requirements of exercising and manoeuvre-grounds, the questions of camps and bivouacs, cantonments, marches, provisions, hospitals, division of time, assessment of damages, &c., are weighed and considered. There is so much really practical matter in the chapter, and the importance of manoeuvres to an army is so great, that we must dwell at some length on the subject.

The following may be taken as a *resumé* of General von Schellendorf's remarks:—

The object of manoeuvres was not originally only the training of troops; employment of the time of long-service soldiers was one of the ends sought to be attained. Great Generals have, however, at all times taken pains to train their armies during peace for war; and, on the other hand, disaster in war has been the consequence of the neglect of peace manoeuvres. The zenith of Prussian success, both in the present and past century, may be significantly referred to as immediately following a time when manoeuvres were considered of the highest importance. The decline of manoeuvres and the fact that military training became more and more confined to the unproductive niceties of peace drill in the beginning of the present century, paved the way for terrible disasters. The result of the battles of the Seven Years' War was mainly due to *eleven years'* "training in closely connected, constant, and numerous manoeuvres." At these manoeuvres no stranger, not even Prussian Officers off duty, were permitted to be present. The manoeuvres were not *spectacles*, but work. After the Seven Years' War Representatives from all nations attended the manoeuvres, and there is a word of warning, not only to the Germans themselves, but also to ourselves, in the following paragraphs:—

"There cannot, however, be the slightest doubt but that the constant pressure of a large number of persons of high rank, fond of display, soon had the effect, though perhaps at first only imperceptibly, of changing the original character of the manoeuvres. It is possible that even towards the close of the reign of the great Frederick too much attention was paid to the precision of *appearance* of the movements of troops in large masses; but it is well known how this tendency was further developed in the twenty years that followed his decease. The mathematical precision with which the colours of battalions advancing in line on the Tempelhof drill-ground were dressed is a type of the military manoeuvres of those days, which the efforts of men of the Yorck and Bülow stamp were unable to counteract by quietly training the newly-formed slender battalions committed to their charge in the open order fighting formation far away on the other side of the Vistula. Then came the disasters of 1806 and 1807."

The Army Corps is considered the largest unit which can conveniently take part on either side in manoeuvres. Passing by the considerations touching the general ideas,

and the details of time given to the manœuvres, we come to the questions of choice of ground. This again is closely connected with the subject of cantonments, and a cursory perusal of the chapter will show that manœuvres are practically impossible unless the civil portion of the nation are prepared to submit to a considerable amount of private inconvenience for the public good. Without the power to canton troops on the inhabitants generally, manœuvres would seem to be impossible. Bivouacking is the more expensive process of housing troops, if we may apply the word to this purpose; the necessities that have to be issued to the troops for bivouacking require a greater outlay than the indemnities that have to be paid if the troops are cantoned; not that bivouacking is altogether to be dispensed with, on account of the practice given to the troops, and the relief to the inhabitants when the troops cover a space small in proportion to their numbers. The right of quartering troops on the inhabitants is based on the law on providing quarters for troops of the 25th June, 1860, which also fixes the indemnity to be paid to the persons furnishing the quarters or billets. Without the co-operation of the civil authorities a well-regulated cantonment is impossible. Provided this co-operation exists, and the "give and take" principle followed, matters are easily arranged.

The amount of accommodation available is reckoned by the number of fireplaces, 1 infantry,  $\frac{1}{2}$  a cavalry or horse artillery soldier,  $\frac{3}{4}$  of a field battery soldier being reckoned to a fireplace in very extended cantonments. This gives about 500 fireplaces to a battalion of infantry, 200 fireplaces to a squadron of cavalry, and 70 fireplaces to a field battery (manœuvre strength). In close cantonments, however, it is even possible to reckon from 3 to 6 men and from 1 to 2 horses per fireplace when the billeting is to last 14 days. Similarly, from 10 to 14 men may be reckoned per fireplace when it is to last a week, and even from 18 to 20 men when it is to last only one or two days, provided the troops receive all their supplies from the commissariat or store. As an instance of the divergence of opinion which is sometimes manifested between the civil and the military authorities as to the billeting accommodation of a tract of country, it may be mentioned that in a *rayon* of country used in 1872 the estimate of the civil power was 6,373 men and 2,604 horses; the practical solution by the military power was 21,157 men and 6,085 horses. The method of feeding the troops varies. In bivouac, and sometimes in cantonments, the food is received direct from the Government stores; sometimes the inhabitants receive the money value of the rations, and in return feed the soldiers; or it may be that the soldier receives the ration in kind, and the inhabitants provide fuel and cooking utensils; or, finally, the soldier may be given the money value of his ration, and he may provide with it his own food.

On the march the soldier is fed by his host, but he must be contented, be he Officer or private, with the fare of the inhabitant.

The difficulty of finding suitable ground in the vicinity of the large garrisons for even the lesser exercises and for rifle-ranges will probably, sooner or later, lead to the establishment in Germany of hut encampments, but, says the author, "We should always remember, however, that the exercises of large bodies of troops at camps of this description would always be of a very one-sided description, that exercises of mixed arms on the drill-grounds in the neighbourhood of a camp must always be very uniform in character, and consequently uninteresting, and that similarly the manœuvres of large bodies opposed to each other would be practically impossible. In the latter case especially the exercise should be always confined to ground the character of which is continually changing, and which consequently continually offers fresh and sudden chances. Otherwise we run the risk of estranging our senior Officers from the habit and necessity of having to decide for themselves in the various situations that are constantly presenting themselves. Such an evil as this would more than outweigh all the apparent advantages connected with the exercise of troops assembled in large camps, however high we might be inclined to hold the latter in estimation."

Such is a brief *résumé* of the salient points touched on in this chapter which is further stored with much valuable information and many useful hints in connection with the movements and maintenance of troops.

The concluding chapter, which treats of reconnaissance, shows a thorough appreciation of the change which has taken place in this science, owing to the diffusion of

information respecting the geography and the resources of foreign countries, and also to the extension and progress of mapmaking. The effect of this latter change on field sketching is well dealt with.

We look forward with much pleasure to the production of the second volume of this valuable work, which will treat of the duties of the General Staff in War.

H.

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*Tactical Examples.* By HUGO HELVIG, Major on the Royal Bavarian General Staff. Vol. I, "The Battalion." Translated by Colonel Sir LUMLEY GRAHAM, Bart. Henry S. King and Co., London, 1877. Size 9 in. x 6 in. x 1 in. Pp. 103. Weight under 1½ lbs. Price 15s.

THE original work was so fully noticed in an article which appeared in the 86th Number of this Journal that it is not necessary to describe its scope again. The following remarks are extracted from the translator's preface:—"If a book of this kind had been published in England some twenty, or even fifteen years ago, I do not believe that one Officer in fifty would have opened it, or that one in a hundred would have read it through.

"But times have changed, for during the last few years a great impulse has necessarily been given to military education, and not only are much greater facilities for instruction afforded to our Officers, but a far higher standard of professional knowledge is insisted upon, whilst at the same time the taste for military studies for their own sake, independently of any direct personal advantage likely to arise therefrom, has widely spread both in the standing army and in the auxiliary forces. Consequently, at the present time a very large proportion of our Officers of all ranks eagerly welcome any new work on tactics, not only reading it, but studying it carefully.

"Still we have not as yet produced many original works on such subjects, and we are compelled to draw largely upon our Continental friends for information and instruction, particularly upon the Germans, who can count able tactical writers by the score.

"Major Helvig, as he says in his preface, lays no claim to producing a set of 'Tactical Receipts' (like receipts for dishes in a cookery book). Such a pretension would be absurd. He only works out as he thinks best a series of tactical problems, such as may fairly be expected to present themselves to a battalion on service. The reader will probably differ from the author as to the best mode of solving some of these problems; and the great value of this book as of the war game, which we imported also from Germany, is that it suggests to the military student so many subjects for reflection and discussion, and leads him to think them out for himself, the more independently the better. With this book before him a commanding Officer need never be at a loss for an interesting and instructive field day, as the thirty examples given in it may be varied *ad infinitum*.

"The author's troops are, of course, organised as in Germany. In working out the examples on the ground, the English Officer will therefore have to adapt the details of execution to our own organization. Each man may easily do this for himself; at the same time I believe that, having done so, most men will come to the conclusion that the Germans are in advance of us in tactical organization, and that their large companies are better than our small companies, both for instruction in peace and for action in war."

The book has only one fault, but, nevertheless, it is a serious one. The style in which it is produced is too good. The book is almost an "article de luxe," and the price, even with the discount everywhere obtainable, is consequently very high.

Messrs. King and their successors, Messrs. Kegan Paul, have done perhaps more, or certainly as much as any publishers, to diffuse military literature in the service, but they seem to forget that the class for whose benefit they are producing these works is not composed of rich men. The requirement of the present day is a military literature, not only good but also cheap. It is to be hoped, however, that the price will not deter Officers from obtaining this valuable work.

H.



**The Journal**  
OF THE  
**Royal United Service Institution.**

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VOL. XXI.

1878.

APPENDIX.

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PROCEEDINGS OF THE FORTY-SEVENTH ANNIVERSARY  
MEETING.

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THE FORTY-SEVENTH ANNIVERSARY MEETING of the Members was held in the Theatre of the Institution, on Saturday, March 2nd, 1878.

The Right Hon. W. H. SMITH, M.P., First Lord of the Admiralty, in the Chair.

I. The Secretary read the notice convening the Meeting.

II. The Secretary read the Minutes of the Forty-sixth Anniversary Meeting.

III. The Forty-seventh Annual Report was read as follows:—

1. The Council have the pleasure of laying before the Members their Forty-Seventh Annual Report.

MEMBERS.

2. Forty-nine Life Members and one hundred and sixty-nine Annual Subscribers, making a total of two hundred and eighteen new Members, joined the Institution during the past year. The loss by death amounted to seventy-seven, and forty-three Members withdrew their names, whilst the names of thirteen have been struck off the list in consequence of the non-payment of their subscriptions for many years, after frequent applications. The increase therefore is eighty-five.

A detailed statement of the changes in the List of Members, and a tabular analysis of the present and past state of the Institution, will be found on pages 6 and 7.

FINANCE.

3. The usual Abstract of the Yearly Accounts, as audited on the 7th February, will be found on the following page.



GENERAL ABSTRACT OF THE ACCOUNTS OF THE ROYAL UNITED SERVICE INSTITUTION,  
FROM 1ST JANUARY TO 31ST DECEMBER, 1877.

EXPENDITURE.		£	s.	d.	RECEIPTS.		£	s.	d.
Secretary's Salary	...	350	-	-	Balance at Bankers, 31st December, 1876	...	...	953	10
Ditto Lodging Allowance	...	50	-	-	Annual Subscriptions, at 10s.	...	...	2,529	16
Librarian's Salary	...	...	...	...	" " above 10s.	...	...	38	5
Clerk's Salary	...	...	...	...	" " arrears	...	...	12	10
Steno's Wages	...	...	...	...	" " advances	...	...	4	-
Ditto Clothing	...	...	...	...	Increased Subscriptions, at 10s.	...	...	...	...
Insurance	...	...	...	...	Entrance Fees	...	...	2,839	19
Ground Rent	...	...	...	...	Donations	...	...	218	2
Fuel	...	...	...	...	Dividends	...	...	3	1
Lighting	...	...	...	...	Interest on Exchequer Bills	...	...	373	8
Assessed and Income Taxes	...	...	...	...	Government Grant	...	...	19	-
Parish and Water Rates	...	...	...	...	Sale of Journals	...	...	600	-
Artificers	...	...	...	...	Miscellaneous Receipts	...	...	148	6
Museum	...	...	...	...		...	...	20	16
Gold Medal	...	...	...	...		...	...	9	
Library, Reading, and Topographical Rooms	...	...	...	...		...	...		
Advertisements	...	...	...	...		...	...		
Printing Circulars and Stationery	...	...	...	...		...	...		
Lectures	...	...	...	...		...	...		
Journals, including Annual Report and List of Members	...	...	...	...		...	...		
Postage { Letter...	...	26	8	7		...	...		
Journals	...	232	4	3		...	...		
House Expenses and Sundries	...	...	...	...		...	...		
Cash repaid to Agents	...	...	...	...		...	...		
Charges from ditto	...	...	...	...		...	...		
For £420 5s. 4d. 3 per cent. Consols	...	...	...	...		...	...		
Balance at Bankers	...	...	...	...	Balance of Life Subscriptions at Bankers, 31st December, 1876	...	...	14	10
	...	...	...	...	Life Subscriptions	...	...	526	-
Total Income and Life	...	...	...	...	Total Income and Life	...	...	£4,854	9
	...	...	...	...		...	...	9	3

Examined and found correct—  
7th February, 1878.

J. E. A. DOLAN,  
EDWD. DRAPER,

ERNEST R. RAINT,  
TOB. G. RIDGWAY,

T. D. SULLIVAN, Accountant.

ESTIMATE OF RECEIPTS AND EXPENDITURE FOR THE YEAR 1878.

EXPENDITURE.			RECEIPTS.		
	£	s. d.		£	s. d.
Secretary's Salary and Lodging allowance .. ..	400	- -	Balance at Bankers, 31st Dec., 1877 .. ..	120	- -
Librarian and Accountant's do. ..	230	- -	Annual Subscriptions:		
Clerk's do. .. ..	130	- -	£ s. d.		
Servants' Wages .. ..	520	- -	At 10s. .. ..	250	- -
Ditto Clothing .. ..	65	- -	Above 10s. 2,530 .. ..	- -	- -
Insurance .. ..	18	- -		2,780	- -
Ground Rent .. ..	205	- -	Entrance Fees .. ..	200	- -
Fuel .. ..	60	- -	Dividends .. ..	380	- -
Lighting .. ..	55	- -	Interest on Exchequer Bills .. ..	20	- -
Assessed and Income Taxes .. ..	65	- -	Government Grant .. ..	600	- -
Parish and Water Rates .. ..	100	- -	Sale of Journals .. ..	100	- -
Artificers, Repairs, &c. .. ..	100	- -	Miscellaneous Receipts .. ..	20	- -
Museum .. ..	100	- -			
Gold Medal .. ..	12	- -			
Library and Topographical Departments .. ..	200	- -			
Advertisements .. ..	150	- -			
Printing Circulars, & Stationery .. ..	150	- -			
Lectures .. ..	50	- -			
Journals, including Printing Annual Report and List of Members .. ..	1,300	- -			
Postage of Journals .. ..	200	- -			
Postage .. ..	30	- -			
House Expenses and Sundries .. ..	60	- -			
Balance .. ..	20	- -			
Total .. ..	£4,220	- -	Total .. ..	£4,220	- -

LIFE SUBSCRIPTIONS.

4. Life Subscriptions to the amount of £420 5s. 4d., including £14 10s. not invested in 1876, have been invested in Three per Cent. Consols.

CAPITAL ACCOUNT.

5. The funded property of the Institution on the 1st January, 1878, was £11,725 0s. 7d., as compared with £11,304 15s. 3d., on the 1st January, 1877.

THE FUTURE LOCALITY OF THE INSTITUTION.

6. The Council regret that they are still unable to give the Members any information on this subject.

#### LECTURES AND JOURNAL.

7. During last year's session, twenty lectures were delivered, and fourteen papers were read and discussed in the Theatre of the Institution. The Council take this opportunity of recording their best thanks to those Gentlemen who thus afforded so much valuable professional information.

The arrangement by which a portion of the Journal is reserved for "Occasional Papers" and for translations and reviews of foreign publications has proved very successful.

The Members will doubtless appreciate the ability and care bestowed by Lieut.-Colonel Hale, R.E., on this portion of the Journal, of which he is the honorary Editor.

The Journal has fully maintained its high character during the past year.

An Index of the subjects contained in the last ten Volumes of the Journal will shortly be issued.

#### LIBRARY.

8. Five hundred and eighty-five volumes were added to the Library during the past year; of these, 265 were purchased and 320 presented. Among the latter, the following are the most noteworthy:—

By the AUSTRIAN Government—

*Mittheilungen über Gegenstände des Artillerie- und Genie-Wesens.*

*Mittheilungen aus dem Gebiete des See-wesens.*

*Organ des Wiener Militär-wissenschaftlichen Vereins.*

By the FRENCH Government—

*Revue Maritime et Coloniale.*

„ *Militaire de l'Étranger.*

By the GERMAN Government—

*Archiv für die Artillerie- und Ingenieur-Offiziere des Deutschen Reichsheeres.*

*Jahrbücher für die Deutsche Armee und Marine.*

*Militär-Literatur-Zeitung.*

*Neue Militärische Blätter.*

By the NETHERLANDS Government—

*Four Plates of "Matériel de l'Artillerie."*

By the RUSSIAN Government—

*Engineering Journal.*

*Naval Review.*

By the SWEDISH Government—

*Krigs-Vetens-Kaps Akademiens Handlingar.*

By the UNITED STATES Government—

*Twenty-two Volumes, on various Naval and Military subjects.*

The exchange of Journals with Foreign Governments, and with various Scientific Societies, in this and other Countries, has been continued.

The Library now contains 18,300 volumes.

The Secretary of State for War has presented Photographs and Lithographs of Guns, Casemates, Shields, Targets, &c., and copies of works published by the War Office.

The Institution has also received from the Lords Commissioners of the Admiralty, Charts, Sailing-Directions, and other valuable works.

#### MUSEUM.

9. A list of the additions to the Museum and to the Library will be found in the Proceedings of this day's Meeting, and in the Appendix to Vol. XXI. of the Journal.

As the prospect of obtaining a more commodious building seems still remote, the Council hope, by a re-arrangement of some of the rooms, to gain space for such new models as the means at their disposal may enable them to purchase.

#### VICE-PATRONS.

10. It is with deep regret that the Council have to record the death of one of the Vice-Patrons of the Institution, Admiral of the Fleet Sir Henry J. Codrington, K.C.B.

Sir Henry Codrington was one of the original Members of the Institution, having joined it in 1831, and from 1857 to 1877 served for several years on the Council as a Member and as Chairman. On attaining the rank of Admiral of the Fleet, the Council elected him a Vice-Patron of the Institution. Sir Henry Codrington was ready at all times to give his valuable services in promoting the interests of the Institution, and it has sustained a great loss by the death of this distinguished Officer.

The Council have had the pleasure of electing Vice-Patrons of the Institution His Grace the Duke of Somerset, K.G., Field-Marshal Sir William Rowan, G.C.B., Sir Charles Yorke, G.C.B., the Right Hon. Lord Strathnairn, G.C.B., G.C.S.I., and Admiral of the Fleet the Hon. Sir Henry Keppel, G.C.B.

#### HONORARY MEMBERS.

11. The Council have admitted several Officers of Foreign Armies as Honorary Members during their stay in this country.

## CORRESPONDING MEMBERS OF COUNCIL.

12. On the 1st January, 1878, there were 320 Corresponding Members of Council.

Whilst thanking the Corresponding Members for their past services, the Council earnestly invite their co-operation in making the advantages of Membership more widely known.

## GOLD MEDAL.

13. Eleven Essays were received in competition for the Gold Medal, the subject being "Great Britain's Maritime Power; how best developed," &c., &c. Admirals the Hon. Sir Frederick Grey, and Sir Walter Tarleton, and Vice-Admiral Sir Leopold M'Clintock, kindly undertook the duties of Referees. Their award will now be made known to the Meeting.

The subject for the Military Essay for this year is—

"Field Intrenching; its Application on the Battle-Field, and its Bearing on Tactics."

## CONCLUSION.

In concluding this their Forty-seventh Report, the Council point with satisfaction to the increase in the number of Members, to the sound condition of the finances, and to the high estimation in which the Institution is held, both at home and abroad.

STATEMENT OF CHANGES AMONG THE MEMBERS SINCE  
1ST JANUARY, 1877.

	Life.	Annual.	Total.
Number of Members, 31st December, 1876 ..	1,136	3,184	4,320
"          "          joined during 1877 ..	49	169	218
	<u>1,185</u>	<u>3,353</u>	<u>4,538</u>
Changed from Annual to Life	+ 9	- 9	
	<u>1,194</u>	<u>3,344</u>	<u>4,538</u>
	Life.	Annual.	
Deduct—Deaths during 1876 ..	17	60	
Withdrawals.. ..	—	43	
Struck off .. ..	—	13	
	<u>17</u>	<u>116</u>	
	17	116	133
Number of Members on 1st January, 1878	<u>1,177</u>	<u>3,228</u>	<u>4,405</u>

TABULAR ANALYSIS OF THE STATE OF THE INSTITUTION

To 31st of December, 1877.

Year. 1st Jan. to 31st Dec.	Annual Subs. received.	En- trance Fees.	Income (from all sources).	Life Subs. received.	Amount of Stock.	Invested in the purchase of Books, &c.	No. of Vols. in Library.	No. of Mem- bers on the 31st Dec.	Number of Visitors
£	£	£	£	£	£	£			
1831	654	..	654	1,194	..	..	..	1,437	..
1832	1,146	..	1,146	973	..	..	..	2,699	..
1833	1,405	..	1,450	692	..	..	..	3,341	..
1834	1,500	..	1,549	583	1,100	..	..	3,748	13,376
1835	1,480	..	1,574	366	2,430	40	..	4,155	8,537
1836	1,570	..	1,682	330	3,747	45	..	4,069	8,521
1837	1,549	..	1,747	222	4,747	180	..	4,164	10,907
1838	1,462	..	1,634	230	5,500	246	..	4,175	15,788
1839	1,399	..	1,565	168	5,500	292	..	4,186	16,248
1840	1,363	..	1,525	198	5,500	446	5,500	4,257	17,120
1841	1,450	..	1,643	186	6,000	243	5,850	4,243	19,421
1842	1,378	..	1,565	144	6,400	373	6,450	4,127	21,552
1843	1,299	..	1,494	140	6,700	237	7,000	4,078	27,056
1844	1,274	..	1,408	112	3,000	298	7,850	3,968	22,767
1845	1,313	..	1,466	228	1,500	127	8,100	3,988	21,627
1846	1,298	..	1,456	138	1,500	74	8,410	4,031	32,885
1847	1,314	74	1,502	132	1,700	37	..	4,017	33,699
1848	1,175	57	1,375	48	1,700	85	9,641	3,947	37,140
1849	1,176	72	1,375	84	1,150	58	..	3,970	33,333
1850	1,141	106	1,294	198	600	36	..	3,998	33,773
1851	1,136	131	1,292	66	666	34	10,150	3,188	52,173
1852	1,134	133	1,281	114	200	43	10,300	3,078	20,609
1853	1,243	319	1,684	264	528	41	10,420	3,251	25,952
1854	1,200	138	1,368	126	612	95	10,587	3,171	22,661
1855	1,159	107	1,289	120	653	55	10,780	3,131	14,778
1856	1,216	197	1,519	156	761	47	10,832	3,204	16,184
1857	1,258	176	1,937	78	1,038	40	10,960	3,168	12,755
1858	1,318	221	2,102	105	438	31	11,062	3,246	25,747
1859	1,526	195	2,277	512	946	70	11,320	3,344	28,739
1860	1,961	298	3,577	397	2,178	114	11,517	3,518	28,011
1861	2,122	305	2,899	266	2,846	99	11,812	3,689	23,296
1862	2,296	242	3,127	239	3,178	109	12,026	3,797	27,215
1863	2,379	218	3,100	405	3,583	143	12,296	3,847	18,150
1864	2,425	215	3,253	222	4,516	116	12,700	3,902	17,276
1865	2,435	154	3,467	235	4,804	137	13,000	3,895	18,253
1866	2,435	157	3,488	299	5,486	150	13,337	3,891	17,067
1867	2,431	141	3,467	208	5,732	140	13,800	3,823	17,211
1868	2,446	184	3,534	297	6,396	119	14,100	3,812	16,417
1869	2,368	165	3,485	238	6,658	232	14,669	3,792	15,947
1870	2,376	178	3,493	333	7,313	140	15,055	3,831	18,654
1871	2,455	237	3,677	538	7,748	202	15,501	3,922	19,420
1872	2,620	336	4,111	713	8,927	192	15,761	4,116	19,773
1873	2,776	295	4,316	535	9,465	222	16,227	4,276	18,183
1874	2,819	216	4,491	409	10,189	218	16,624	4,330	16,771
1875	2,801	154	4,595*	469	10,721	228	17,000	4,308	15,960
1876	2,794	162	4,500	437	11,305	171	17,700	4,320	15,543
1877	2,840	218	4,750	526	11,725	217	18,300	4,405	15,682

\* A legacy of £100 was received this year.

## IV. Admiral the Right Hon. Lord DUNSANY :—

Mr. Chairman,—It is a very pleasant duty to move the adoption of the Report, and I may say so now, with more than conventional truth, for it is always pleasing to witness the constantly-growing prosperity of any Institution in which one feels an interest ; and although it cannot be said of our advance in prosperity, as Mr. Gladstone said sometime ago of the National Income, that we advance by leaps and bounds, still we do see that every year there is a steady increase. Our Income is larger, our Capital is larger than it ever has been ; we have a greater number of Members, and, I need hardly say, there has been a very great addition to our Stock in various departments. I shall not dwell upon any of the special departments of the Institution, because they will be spoken to by others better acquainted with the details than I am myself ; but I cannot resist saying something, if it were only from mere gratitude, as to our valuable Library. The meeting has heard that there are 18,000 volumes ; but it is not to that I would attach much importance, for 18,000 volumes forms but a small Library : it is its special, I may say its unique, character in comprehending all the professional works of any value in this country, and not that alone, but as you have all heard in the Report the valuable professional works coming from every great country in Europe. It is that very large stock of professional knowledge which gives to this Institution an educational value, making it, I may say, of some National and of some Public interest and importance. If ever there was a time when large and general knowledge was not essential to the Officers of both Services, that time passed away, when the Army of “spectacled professors,” as they were contemptuously called by France, swept from the Rhineland to the Channel in three months, when it was found that those outer barbarians spoke better French, knew more of French history, more of French geography, more of the local resources of the country than did the Officers, I might almost say, of the French Staff—I hope I am not exaggerating there—when it was found that there was so much knowledge in the hitherto-despised Germans, that, you may say, was the triumph of Education. From that time we have learned to appreciate the value of an Intelligence Department, and I believe that the Intelligence Department not only in Germany and in France, but in this country, has learned to appreciate the value of this Institution. I believe that from the very large stores of general professional knowledge here our own Intelligence Department derives some very considerable advantage, and we know, as we have just heard, that Foreign Governments are fully aware of the value of this Institution. I do not think for one moment it can be denied that it has a very high educational value. It may be said that there are special institutions for education : of course there are ; but when you look at the very large proportion of Officers of both Services not engaged in active service, who gravitate to London, who for one reason or another must take up a residence in London, it can be easily understood how valuable to them is the Library of this Institution. I believe that the Meeting will have a special reason for recognising its value in the production of the talented Officer who was called to write an Essay upon a subject of the utmost public interest. I am perhaps only asserting what I do not actually know, but what has a high inherent probability, that he must have drawn very largely for his information upon the Library of this Institution. While one sees the present and the almost unbounded possible advantages of this Institution and its Library—for it is especially for the Library I am speaking—we are met with a most serious difficulty : we are sadly cramped for room, and our future is altogether uncertain. It is known to all the Members of this Institution that we had lately a rather significant warning of the precariousness of our tenure here, and the Council are not able to tell us what is to happen to-morrow to those very large, those unique, those invaluable treasures which, during forty-seven years, the industry, the zeal, and judgment of the Council have collected. We may be turned into the streets to-morrow ; and, under those circumstances, it is no great wonder that the Council decline to lay out any money, that is not absolutely necessary to keep the building wind tight and water tight. The result strikes every eye when we come down here. We see in large letters, “United Service Institution,” and we recognise at once that



"United Service Institution" signifies something of very great value to this country; but the large letters, the imposing title, stands upon some very dingy walls, and we really feel half ashamed when we think of the great difference between what is, and what very well might be, I won't say what ought to be. In conclusion, I will remark that, by a happy coincidence, it does so seem that the Statesman who earned very much of his well-deserved popularity in a contest for the possession, I believe, of the Thames Embankment, has now, as a just tribute to his merits, been promoted to the head of the Naval profession. As such, it may possibly be that he may see his way to facilitating our acquisition of some site upon the Thames Embankment. I do not know how that may be; I presume it is a matter on which the Treasury must decide, and we know the Cerberus who guards the Treasury, is very jealous indeed if you talk about any demands upon the public purse. Still, I cannot help thinking, no statesman could leave a monument more worthy of his administration than a United Service Institution to which we could point, not with the curious mixture of feelings that we do now, but really with pride and satisfaction. It struck me the other day, I dare say it has struck hundreds of people, that there is a site, and a very appropriate site, in the neighbourhood of our Public Offices, which might, I should think, be acquired on reasonable terms: I am speaking of the abortive Opera House, which I believe will never advance any further than it is now, and, generally speaking, I fancy a bankrupt's property is acquired for something under its value. Whether that will be so or not, it is for our Right Hon. Chairman to decide; but, at all events, one is led to indulge a dream, and to fancy that some day or other upon the Thames Embankment there will rise up a United Service Institution, which will be among the proudest buildings of this great metropolis, and that it will really serve so very useful a purpose, not to the Services alone but to the public, that people will begin to say, "Well, after all, that was not money which was thrown away by the First Lord of the Admiralty." I beg to move, "That the Report now read be adopted and printed for circulation among the Members."

LIEUT.-GEN. C. P. BEAUCHAMP-WALKER, C.B. :—

I have had great pleasure in acceding to the request, that I should second the adoption of the 47th Annual Report of this Institution, because, as Director-General of Military Education, it affords me an opportunity of bearing high testimony to the great value of the Journal. Not only did I find it a great assistance to myself during the twelve years which I passed as Military Attaché in Germany, but I was constantly referred to by Foreign Officers for information on English subjects, and was in most instances enabled to place in the hands of my friends admirably written papers on both Naval and Military subjects. Naturally enough, when I first went to Berlin as a soldier, I knew very little about Naval subjects. I often had questions to answer to the Admiralty which I never could have answered if I had not improved my mind by reading the Naval papers which are published after Lectures have been given in this Institution. I may mention on one occasion, when asked for some information by the Chief of the Staff of the Admiralty at Berlin, I had no difficulty in giving the required information after reference to the Journals in my possession. I certainly could not have reported on the multifarious subjects which come under the observation of a Military Attaché had I not had some work of the kind, and a work the subjects of which are so extremely varied. Further than this I was, by means of the papers published in our Journal, kept *au courant* of what were the subjects of interest in England, and thereby enabled to report in a timely manner. I think a reference to the list of subjects will convince anybody how extremely valuable the papers are, and I would particularly mention papers given to the Institution by Major-General Collinson, R.E.:—better professional papers I have never read in my life, nor papers from which more valuable information could be derived. We published also, at no great profit or no profit at all, as far as I am informed, to the Institution, a translation of an extremely valuable German work, "Extracts from an Infantry Captain's

Journal", by Major von Arnim. That was almost a gratuitous present to the Services. The Essays alone are a volume of most valuable information. We find lectures on "Torpedo Vessels", lectures on "Russian Development in the North Pacific", no uninteresting subject: "on the Development of our Modern War Fleet": "on the use of Fuel for Working Steam Engines": "on the Employment of Artillery in connection with other Arms": "Notes on the Organization and Administration of the French Navy": "the Military Geography of European Turkey"; a Paper on "a Method for Preventing Corrosion of Iron and Steel as applied to Naval and Military purposes," which I remember studying with very great attention, it was almost a new subject to me; another on "the Combustion of Fuel in Boilers"; another "on the progress that has been made during recent years in developing the capabilities of Cavalry"; another translation "on the supply of an army in time of war," perhaps the most important of all subjects, for most men will find they won't fight on empty bellies. In fact, I think what I have mentioned may fairly be taken as a strong proof of the educational value of the papers published in the Journals of this Institution. I really myself, though new in office, have no hesitation in saying I look upon the Journals of this Institution as a most valuable aid to the Officers of the British Army and Navy, who desire to improve themselves in professional knowledge. There is one remark I feel and ought to make, and that is, as to the very serious expense that falls on the Institution by the publication of the Journals. Last year the expense of publishing our Journals was £1,434, and the return from their sale was only £148. Even if you add to that the £600 a year granted by Government in aid of the Institution, you have barely half the sum the Journal actually costs, and it becomes a question whether it might not with fairness be submitted to Her Majesty's Government, that some further assistance should be given to the Institution for this purpose. It is really not a subsidy which would be granted for the mere purpose of gratifying people who come to pass an idle hour in the Institution, but a subsidy which would be spent in providing educational assistance to the Officers of both Services. On personal and public grounds, I feel great pleasure in seconding the Resolution.

The Resolution was put from the Chair, and was carried unanimously.

V. The names of the eight Members retiring from the Council by rotation were read, as follows:—

Lieut.-Colonel F. R. AIKMAN, V.C.  
Vice-Admiral HUGH DUNLOP, C.B.  
Admiral Sir ERASMUS OMMANNEY, C.B., F.R.S.  
Lieut.-Colonel CROSSMAN, R.E., C.M.G.

Rear-Admiral the Right Hon. LORD GILFORD, C.B.  
Captain J. C. WILSON, R.N.  
Rear-Admiral G. O. WILLES, C.B.  
Captain R. A. E. SCOTT, R.N.

Field-Marshal the Rt.-Hon. LORD STRATHNAIRN, G.C.B., G.C.S.I.:—

I have much pleasure in proposing a vote of thanks to the Members of the Council who have retired from their duties. Like the rest of you, my Lords and Gentlemen, I can bear testimony to the extreme usefulness of this Institution and to the readiness with which its Officers supply the amplest information on the interesting topics of the day. The finances of the Institution also appear to have been extremely well regulated, for, with a very small sum, they have achieved most valuable results. We have a Library that has few equals: maps and plans, from the study of which we have all profited, defining strategical positions, facilities of concentration, and the powers of advance and retreat. I myself have experienced the practical results of the advantages of the information thus afforded. We all agree that the interests of Great Britain in this important Eastern Question are material interests; they are the interests of our safety, the interests of our power, and the interests of our good faith. I do not know which we should value most; but I know what our great leader said, that he thought a nation might lose everything but their good

faith. I hope we shall keep this as a beacon before us in the critical times in which we live, and if we do so and look at the resources of this great country, we have nothing to apprehend. There has been an outcry lately and a good deal of sensation caused by statements as to our having become a third-rate Power, as to India having gone, our communications being cut off, and so on. A little reference to the annals and to the valuable records contained in this Library will show that these are delusions. I may give one instance of the information which was afforded here. I was anxious to know the time it would take for an iron-clad fleet to steam from the Dardanelles to Port Said. I wrote to my friend, Mr. Sullivan, who is so proverbial for his willingness in affording information and giving us the advantage of his knowledge of the records of the Institution, and almost with the speed of a telegram came back the answer that it would take an iron-clad fleet 70 hours, at the rate of 9 knots. I mention this to show the advantages that are afforded by this Institution. I have much pleasure in proposing the resolution.

Admiral Sir WALTER TARLETON, K.C.B. :—

I have much pleasure in seconding the resolution that has been put before the Meeting, "That the thanks of this Meeting be given to the Members of the Council who retire by rotation," and that the following Members be elected for the ensuing year :—

Lieut. - Colonel CROSSMAN, R.E., C.M.G.	} For re-election.	Lieut.-General Sir JOHN M. ADYE, K.C.B., R.A., Governor, Roy. Mil. Academy, Woolwich.
Admiral Sir ERASMUS OM- MANNEY, C.B., F.R.S.		General CHARLES STUART.
Vice-Admiral HUGH DUN- LOP, C.B.		Lieut. - General C. P. BEAUCHAMP- WALKER, C.B., Director-General of Military Education.
Captain P. H. COLOMB, R.N. Rear-Admiral M. S. NOLLOTH.		

And that the following names be adopted from which to select in case of vacancies occurring in the Council, namely :—

Lieut.-Colonel R. J. LOYD LINDSAY, C. C., M.P.	Colonel Sir FRANCIS W. FESTING, K.C.M.G., C.B., Assist. Adj.-General, R.M.
Colonel E. H. Clive, Grenadier Guards.	Captain LINDSEY BRINE, R.N.

The motion was put from the Chair, and was carried unanimously.

#### VI. General the MARQUIS OF HERTFORD :—

I have much pleasure in moving "That the thanks of this Meeting be given to the Auditors for their valuable services, and that the following gentlemen be elected for the ensuing year," viz :—

T. E. DRAPER, Esq.	} For re-election.	Captain J. E. A. DOLBY.
E. R. RAITT, Esq.		T. G. RIDGWAY, Esq.

The Resolution, having been seconded by ADMIRAL RYDER, was put from the Chair, and was carried unanimously.

VII. The Secretary read the Report of the Referees on the Naval Prize Essay, on "Great Britain's Maritime Power, how best developed, &c.," and the Chairman announced the name of the successful candidate to be Captain P. H. Colomb, R.N., and presented him with the Gold Medal.

The Secretary then read the names of the writers of the Essays, honourably mentioned (the first three for publication, at the discretion of the Council), viz.: Lieutenant-Commander James B. Haye, R.N.; Lieutenants Eardley-Wilmot, R.N.; Commander Gerard Noel, R.N.; and Commander W. Collingwood Selby, R.N.

General Sir RICHARD WILBRAHAM, K.C.B.:—

I beg to move the following Resolution, "That a vote of thanks be given to the Referees, namely: Admiral the Hon. Sir Frederick Grey, Admiral Sir Walter Tarleton, and Vice-Admiral Sir Leopold M'Clintock, for their valuable services in adjudicating on the Naval Prize Essay." I am sure it must be satisfactory to all Members of the United Service Institution, to know that on every occasion since the first institution of the Gold Medal, some of the most distinguished and accomplished Officers of the two Services have been found ready to accept the invitation of the Council to act as Referees, and have devoted a great deal of time and thought to the very difficult, and, I fear, at times, somewhat tedious, work of reading through all these Essays and deciding upon their comparative merits. We must all feel that in undertaking this task, they have promoted not only the interests of this Institution, but of the Service at large. The Council are well aware that the value of this Gold Medal, not only in the eyes of the fortunate few who receive it, but in the estimation of the public, more especially the professional public, depends greatly upon the choice of Referees, and so long as we are fortunate enough to secure the services of such men as those named in this resolution,—names which command the implicit confidence of the Service to which they belong,—we may feel confident that the Gold Medal of this Institution will continue to fulfil the object for which it was instituted, viz., of promoting among the Officers of both Services, a more thorough, practical and theoretical knowledge of their professional duties.

Admiral Sir FREDERICK NICOLSON, Bart., C.B.:—

I have very much pleasure in seconding the Resolution. It is quite unnecessary for me to allude to the gallant Officers who have been kind enough to act as Referees, but I should like very much, as an old Member of the Council, to express the gratification I am sure we all feel, that an Officer like Captain Colomb, who has contributed so many valuable papers to this Institution, has been the successful candidate. I may also announce, as sometimes our friends do not read our notices, that I believe Captain Colomb has now got two papers on the stocks, which he hopes to launch in a very short time in this Lecture Theatre.

The Resolution was then put from the Chair, and was carried unanimously.

The Chair was then taken by General Stephenson, C.B.

GENERAL McMURDO, C.B.:—

I rise to propose a vote of thanks to the Right Hon. Gentleman who has presided over this Meeting, the proceedings of which are of an interesting character, to-day, referring as they especially do to that branch of the Service of which he is the head. The Right Hon. Gentleman has had an opportunity of observing to-day the great scope of study which constitutes the object of this valuable Institution, and I am quite sure that he will leave it impressed with its public utility, and, as a Minister, will, I dare say, do all that may lie in his power to advance its objects. I hope that he will not consider that this Institution is confined to the regular Services altogether, for it is thrown open most liberally by the Council to all

students belonging to the Auxiliary Services as well. This Theatre has been placed at the disposal of the National Rifle Association, it has also been opened to the National Artillery Association. In this place most interesting lectures have been delivered by the Garrison Instructor of the Home District, to Officers of the Auxiliary Forces, which have been very fully attended, and the Council has also allowed even individual Officers of the Volunteers to come here and deliver lectures on military subjects. We have heard with satisfaction of the accession of Members in the past year, including a proportion of Volunteer Officers. But I would take this public occasion of calling upon the Auxiliary Services to recognise, by an increased membership, the advantages they derive from the Institution. I have now the pleasure of moving a vote of thanks to the Right Hon. the Chairman.

Admiral Sir SPENCER ROBINSON, K.C.B. :—

My Lords and Gentlemen,—It is with very great satisfaction indeed that I second the Resolution which has just been proposed to you. I am still more pleased that the Right Hon. Gentleman, whose time we know is deeply engaged and whose labours can be of no light character, has found leisure to come amongst us for a moment. I hope his visits here will be as frequent as, I am certain, they are useful and advantageous to the interests of this Institution. We all know very well the immense amount of labour, the indefatigable trouble that must be taken by a Gentleman who takes the arduous, the difficult, the important and, perhaps in some respects, the ambitious position of First Lord of the Admiralty. No light labours rest on his head; no decisions that he can come to, are of no importance. His work is great; his troubles begin from the time he wakes in the morning till he goes to bed at night; and, in addition to all these labours, which are requisite to maintain the Naval Administration, as it will be maintained, I have no doubt, under his auspices, the Right Hon. Gentleman has the House of Commons to attend to, and that, I think, is a task of immense labour, such as cannot very well be exaggerated. I do not wish to detain you for a moment; but will record, most heartily and cordially, the proposition that the thanks of this Institution be given to the First Lord of the Admiralty for his kindness in coming here to-day, and express the hope from the bottom of my heart that this will not be his only visit to the Institution.

The Resolution was then put from the Chair, and was carried by acclamation.

The Right Hon. W. H. SMITH :—

My Lords and Gentlemen,—I desire to thank you most warmly for the manner in which you have received me to-day. I ought to apologise, in the first instance, for being a little late; but you are aware that there are other duties to be discharged, and from which it is impossible for a Minister to separate himself when his colleagues are in consultation. I own I feel some diffidence in appearing before you on this occasion on account of my extreme youth in the office which I have the honour to hold. It has not been my good fortune hitherto to be greatly associated either with the Navy or with the Army, excepting so far as financial considerations have entered into the administration of those two great Departments. During the four years of my official life which preceded my appointment as First Lord of the Admiralty, I certainly had an occasional insight, a glimpse into the interests and the administration of those two great Departments, and, I am bound to say, that the resources of the country cannot be better applied than in maintaining a strength—an adequate strength—for defence and for the purpose of maintaining the honour of the country. Reference has been made by the noble Lord (Lord Dunsany), who moved the first Resolution, to the position in which you find yourselves in this Institution. I remember that about a year ago I had the honour to receive a Deputation at the Treasury upon the same matter, and I think I can ask those Gentlemen who did me the honour to wait upon me, to bear testimony to the fact that I then fully recognised the importance of the claims of this

Institution—the claims it had upon the support of the country. I can say no more on the present occasion than that, as a Minister of the Crown, I do feel the great importance of contributing in every possible way to improve the Educational machinery by which Officers and Men, upon whom will depend at some time or other—I hope it will be very remote—the honour and interests of the country,—I say to improve their Educational capacity for discharging their duties to the utmost of their ability. I regard the increase which you have reported to-day in, the number of Members of this Institution as a sign, an evidence of the gravity and earnestness of Officers in the discharge of the duties of their profession. The number may not be quite up to the mark which the Council and Members of this Institution desire it should attain, but it is an evidence of a growing seriousness, if I may venture to say so, in the appreciation of the responsibility of the position which an Officer serving under the Crown is placed. There is no doubt that it is a responsibility. A man does not simply hold his commission and discharge his duties for his own satisfaction and pleasure; but he has, in a certain degree, in his keeping the honour and the interests of the country. If I might venture to say so, I am sure I am only expressing the feeling and the opinion of every Officer present; he does try, to the best of his ability, to improve the advantages and the intellect which God has given him, and to make use of his powers for the protection of the interests confided to his charge. I will not venture to follow upon the subjects to which my noble friend, Lord Strathnairn, has referred; but it would be mere affectation if I were not to say that the incidents which are passing around us are grave, that they are incidents which give all of us concern, and of which, as I trust, the cloud may pass away without producing the great mischief and the great trouble of war. But to discharge its duties properly and efficiently, a nation like ours must be strong. If it is strong, it can be calm in its strength. If it is calm, it can be reasonable; if it is reasonable, it can be just to all who are concerned; it can maintain good faith, can duly and fully and carefully weigh the claims of other nations, which can estimate the responsibilities of the position which it occupies; and I think, I may venture to say, that that is the position of Great Britain at the present moment. I must refer for one moment to the fortunate position in which I find myself, that, on this my first appearance in this room, the subject for the Essay should have been, “Great Britain’s Maritime Power, and how best it may be developed.” I think the meeting will sympathise with me in the feeling which I express here, that, circumstanced as I am at the present moment, I cannot find out a better employment of my time than in acquainting myself with that which the able Referees who have decided this question, pronounce to be the best Treatise which has been written upon the development of the Maritime Strength of Great Britain. It would be exceedingly wrong that I should undervalue the great services of the Army, the sister Service, on which frequently the Navy depends, if sometimes occasionally the Navy is the means by which the Army becomes efficient; but I own I do feel that the Maritime strength of this country is the first interest of this country, and I perhaps may repeat that which I have said before, without offence in this room, that that Maritime strength consists not only in the ability of the Officers who constitute the Royal Navy, in the courage and resources of the men, in the skill and science which produce our ships, in the material resources which we possess in that respect; but it also consists in this, that we have in the Merchant Steam Navy of this country, a vast field to draw upon, which, in time of real necessity and great emergency, would afford, I believe, valuable help. My Lords and Gentlemen, I apologise to you for having taken up so much of your time. The opportunities I have for consideration what to say, on occasions like this, are extremely small. As it has been remarked, the work of the First Lord of the Admiralty begins early in the morning and ends late at night, and he has not much time for that; still I thank you very much for giving me the opportunity of attending here to-day, and I hope, if I am permitted to remain in the office which I hold, I shall often be among you; and, if not, I may still be welcomed among you as a guest, if I am not here in any official capacity.

## NAMES OF MEMBERS

WHO JOINED THE INSTITUTION BETWEEN THE 14TH SEPTEMBER  
AND THE 31st DECEMBER, 1878.

### LIFE.

Barber, Basil C., Mid. R.N.  
Tufnell, A. J., Major 34th Regiment.  
Maquay, J. P., Lt.-Colonel R.E.  
Corfe, Rev. Chas. J., M.A., Chaplain  
R.N.  
Davis, H., Major 29th Regiment.  
Holmes, Thomas, Lieut. R.N.  
Mann, W. F. S., Comr. R.N.

Ravenhill, P., C.B., Colonel R.E.  
Miln, James, Dep.-Lieut. of Perthshire.  
Corbet, Walter O., Lieut. Cold. Guards.  
Amherst, Hon. Hugh, Lieut. Cold.  
Guards.  
Trueman, Fredk., Lieut. 1st Sussex  
Art. Vols.

### ANNUAL.

Kiddle, William W., Comr. R.N.  
Maitland, P. J., Lieut. 3rd Sind Horse.  
Macpherson, J. L., Captain R.E.  
Twibill, James, Lt.-Colonel, late 39th  
Regiment.  
Mascall, Francis, Captain R.E.  
Gaynor, George, Lt.-Colonel, late 104th  
Regiment.  
Eardley-Wilmot, A., Lieut. R.A.  
Gordon, E. S., Captain R.A.  
Yorke, H. A., Lieut. R.E.  
Nicholson, H. A., Capt. 82nd Regiment.  
Barker, George, Lieut. R.E.  
Marsh, J. T., Captain R.E.  
Armstrong, R. Y., Captain R.E.  
Wynne, E. T., Captain R.E.  
Hitchcock, T. B., Captain 53rd Regt.  
Morris, W. G., Lieut. R.E.  
Maitland, J. M. H., Major R.E.  
Lewin, H. F. C., Major R.E.  
Howlett, A., Lieut. Madras S. Corps.  
Davy, James J., Capt. 105th Regiment.  
Livesay, R. A., Captain R.E.  
Martin, C. N., Lt.-Colonel, R.E.  
Thompson, Chas. C., Captain Leicester  
Militia.  
Burnaby, E. S., Lt.-Col. Gren. Guards.

Hickey, R. J. F., Major, late 101st  
Regiment.  
Barthorp, Arthur, Captain, late 10th  
Hussars.  
Forjett, F. H., Captain Bom. S. Corps.  
Malcolm, Sir Geo., K.C.B., General.  
Rose, Sir Wm. A., Kt., Colonel Royal  
London Mil.  
Henry, C. S., C.B., M.-General R.A.  
Webb, C. E., Captain, late H. A. Com-  
pany.  
Halpin, George, Colonel, late Mad. S.  
Corps.  
Nares, E. Denne, Major, late Adj. Rl.  
Carnarvon Mil.  
Macdonald, Lorne, Major Ben. S.  
Corps.  
Browell, E. T., Captain R.A.  
Fairholme, Charles, Captain R.N.  
Berkeley, W. H., Captain Gambia  
Militia.  
Collum, James C., Lieut. 28th Middx.  
Rifle Vols.  
Graves, F. J., Lieut. 20th Hussars.  
Surtees, Herbert C., Lieut. Cold. Guards.  
Macdonald, W. C. R., C.B., M.-General.  
Ross, John F., Captain R.N.



ANNUAL.

Haythorne, Sir Edmund, K.C.B., Lt.-General	Jervoise, J. P. E., Captain 3rd Hussars.
Applin, Vincent J., Captain, late Mil. Train.	Alington, Henry R., Lieut. 6th Line. Rifle Vols.
Dawson, Hon. A. L., Lieut. Cold.Guards.	Richardson, John, Lieut. R.N.R.
Gough, Hon. H. R. A., Lieut. Cold. Guards.	Glasgow, J. C. Robertson, Lieut. 12th Regiment.
Beech, R. J., Lieut. 16th Lancers.	Quekett, Owen C., Lieut. 1st Middx. Engineer Vols.
Montmorency, Hon. R. H. de, Lt.-Col. 32nd Regiment.	Barber, L. G., Lieut. 9th Middx. Rifle Vols.
Stabb, H. S., Major 32nd Regiment.	Boyle, C. J., Lieut. 52nd Regiment.
Cameron, Eugene H., Major R.A.	Barker, J. C., Lieut. R.E.
Walker, J. S., Captain 42nd Highlanders.	Willoughby, R. F., Captain, 21st Rl. Scots Fusiliers.
Rough, W. E. M., Lieut. 7th Dragoon Guards.	Mellish, Henry, Lieut. 2nd Notts Rifle Vols.
Feilden, H. B., Lt.-Col. 6th Regiment.	Josephs, W. D., Captain 4th Middx. Rifle Vols.
Murray, D. C., Lieut. 6th Regiment.	Mewburn, John, Lt.-Col. 15th Lanc. Art. Vols.
Stevenson, J. W., Lieut. 6th Regiment.	
Thackwell, J. E. L., Major Rl. Cork Art. Mil.	

# ADDITIONS TO THE LIBRARY AND MUSEUM DURING 1877.

## LIBRARY.

*Where London is the place of Publication, the word London is omitted.*

*Where no size of Volume is mentioned, the Work is in 8vo.*

*Where no date is mentioned, 1877 is the year of publication.*

### BOOKS PRESENTED.

- ABEL, Professor, F.R.S. Inaugural Address. Society of Telegraph Engineers. 24th January. *Professor Abel.*
- ADMIRALTY. The Nautical Almanac for 1881. *The Lords of the Admiralty.*
- ARTILLERY. Manual of Field Artillery Exercises. *The Secretary of State for War.*
- ASSOLLANT, A. Campagne de Russie, 1812. 4to. Paris. *Lieut. G. H. Hoste.*
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- Portrait of Lt.-Colonel D. Taylor,  
formerly of the 20th Light Dragoons.

*G. J. S. Camden, Esq.*

- Patent Combination Bedstead and  
Spring Mattress for Hospitals, &c.

*Mitford Slade, Esq.*

- Model of a Man of the Manchu Military  
Police Force raised by the Imperial  
Chinese Government and officered by  
Europeans, to protect the Treaty-port  
on the Lian River, Yingtzu.

*Captain J. Alex. Man, Royal  
Aberdeenshire Highland Militia.*

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